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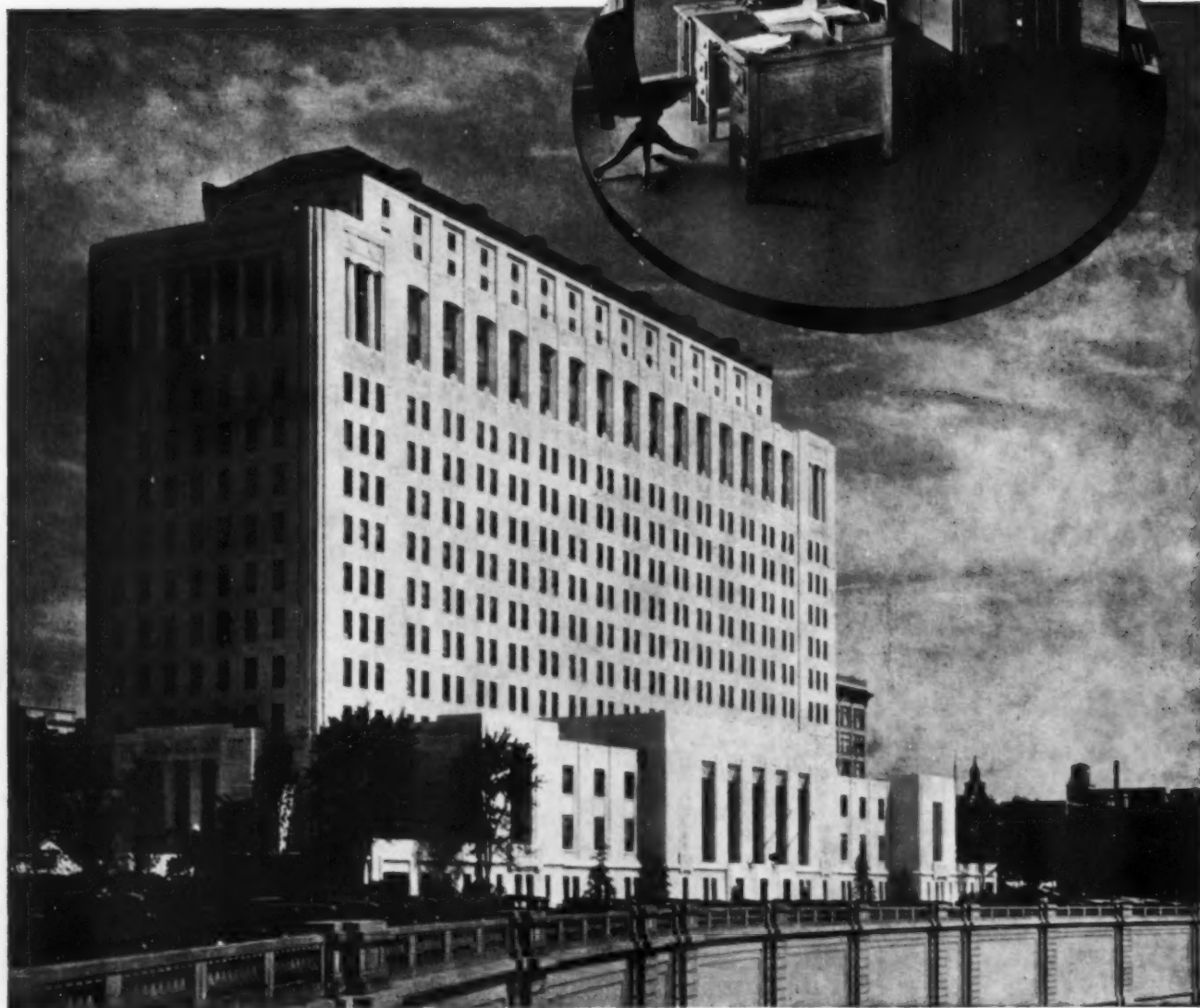


**THE**  
**ARCHITECTURAL RECORD**  
**1934**

**5**

NEW ARCHITECTURE - HOUSE WIRING

**T**HE quest for the most desirable floor for the Ohio State Office Building, Columbus, Ohio, ended in the choice of Sealex. 200,000 square feet of Sealex Battleship Linoleum were installed in this handsome building. Architect: Harry Hake, Cincinnati, Ohio.



## *Why Sealex was specified* for the Ohio State Office Building

Architects can't afford to take chances with equipment for public buildings. These points of interest come in for much critical appraisal. Sealex Linoleum Floors are specified in this field because Sealex has proved not one or two, but many points of superiority.

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**FLOORS AND WALLS**







VOL. 75 NO. 5  
MAY, 1934

# THE ARCHITECTURAL RECORD

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WINDOW DETAIL. HOUSE AT WIESBADEN, GERMANY. Marcel Breuer, Architect

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# Stucco that grows old gracefully

These two structures, both in Playland Park, Rye Beach, New York, interest the eye as examples of stucco applied in "float finish." The *Artstone* stucco (a prepared stucco) is cream color, made with Atlas White plus pigment. As applied, it gives a monolithic concrete appearance to the exterior, and is, in fact, comparably sturdy and durable and weatherproof.

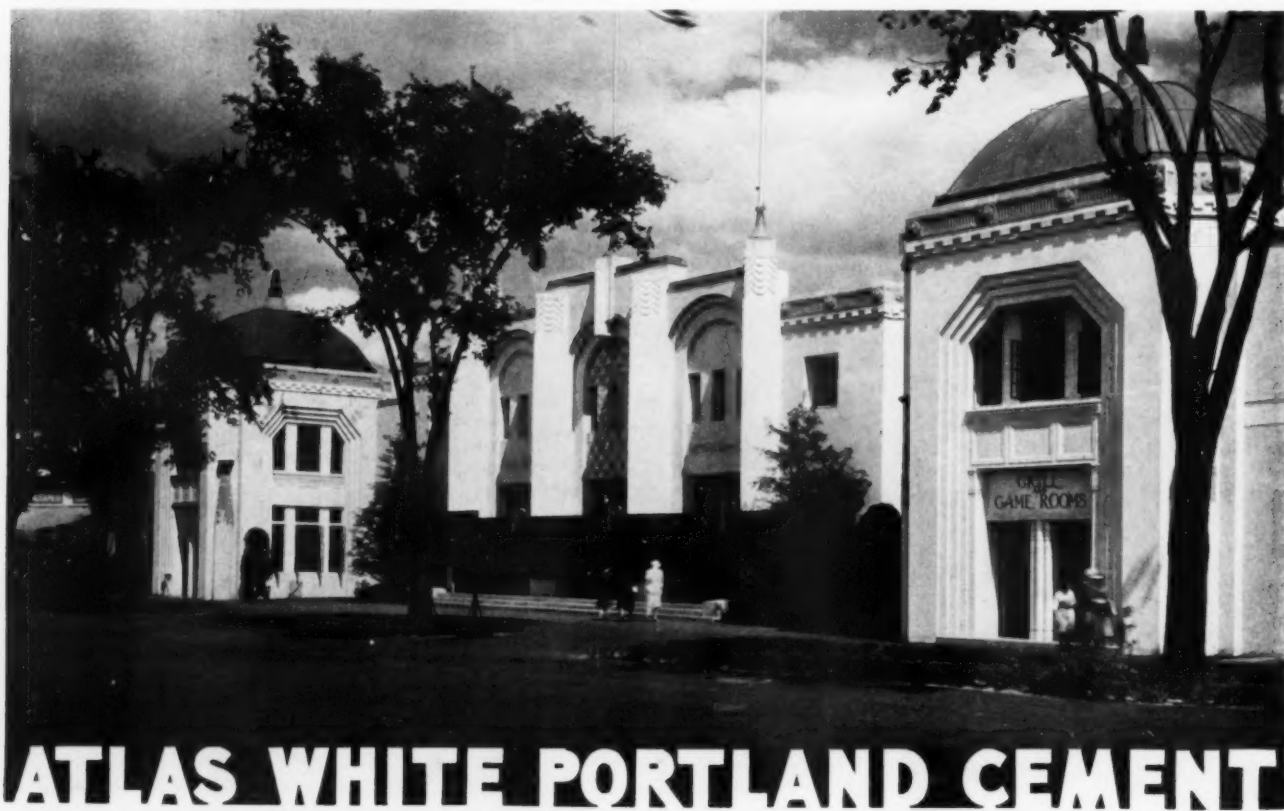
Not new, these buildings are proving that portland cement stucco, rightly made and applied, grows old gracefully. Weathering adds charm to the pleasant light colors possible with Atlas White. The stucco takes on a warm, weathered tone most pleasing against a background of trees and shrubs and green lawns.

Whatever the texture chosen and in any of the varied colors possible, Atlas White stucco makes an attractive and lasting exterior on almost any type of structure, new or old. You will be interested in the detailed information—write Universal Atlas Cement Co., *Subsidiary of United States Steel Corporation*, 208 South LaSalle Street, Chicago.

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E. Glsonde, Inc., Mt. Vernon, N. Y., was the stucco contractor. Johnson and Miller, Inc., Yonkers, N. Y., were the general contractors. Walker and Gillette, N. Y. C., were the architects. Artstone Rocor Corp., Brooklyn, furnished the stucco.



## ATLAS WHITE PORTLAND CEMENT

# ARCHITECTS' ANNOUNCEMENTS

Harry O. Nelson, architect, has moved from 2277 S. W. 4th Street, Miami, Florida, to 604 Fifth Street, Miami Beach, Florida.

Morris M. Pulver, architect, wishes to announce the opening of an office for the general practice of architecture, at 1407 Hermant Building, 21 Dundas Square, Toronto, Ont., Canada. Mr. Pulver would like to receive manufacturers' samples, literature and catalogues.

Samuel Zouri Moskowitz, architect, of 578 Madison Avenue, New York City, is opening an office in the Meyer Building, Public Square, Wilkes-Barre, Pa.

The partnership of Zenk & Campbell, architects, has been dissolved, and Richard A. Zenk is continuing his architectural practice at 144 W. Wood Street, Youngstown, Ohio.

## COMPETITION FOR POST OFFICE LOBBY DESIGN

The architectural division of the Quarry Tile Industry announces an architectural competition for a post office lobby design. The competition is open to all architects and draftsmen not associated with the tile industry and there is a first prize of \$200, a second prize of \$100 and a third prize of \$50.

The jury will be composed of five prominent architects whose names will be published at a later date. All drawings must be mailed not later than June 15. For program and further information, write Carl P. Dumbolton, Architectural Director, Quarry Tile Industry, 600 Investment Building, Washington, D. C.

## CORRECTION

All layouts of work for plan and engineering service for the Merchandise Mart, St. Louis, Mo., were rendered by W. J. Knight and Company, Consulting Engineers of St. Louis. This was inadvertently omitted from the March issue of THE ARCHITECTURAL RECORD in which the Merchandise Mart was shown.

## SEVENTH ANNUAL SMALL HOUSE COMPETITION

Architects and architectural designers are invited to enter the small house competition conducted by House Beautiful combined with Home & Field. The competition calls for photographs and plans of houses built recently in the United States and not published in a national magazine (architectural magazines excepted).

The houses will be judged and prizes awarded in three classes, as follows:

## CALENDAR OF EXHIBITIONS AND EVENTS

May 16-18	Sixty-Sixth Convention of The American Institute of Architects, to be held in Washington, D. C.
May 19-31	Competition for the Princeton Prizes in Architecture.
Until June, 1934	Remodeling Competition, conducted by the Good Housekeeping Studio, 57th Street and Eighth Avenue, New York City.
June 1	Closing date for applications for Brunswick-Balke-Collender bar design competition. Apply to Angelo R. Clas, professional adviser, 333 North Michigan Avenue, Chicago, Ill.
June 15	Closing date for entries of post office lobby design. Address, Carl P. Dumbolton, Architectural Director, Quarry Tile Industry, 600 Investment Building, Washington, D. C.
July 1	Closing date for entries, Small House Competition. Address, House Competition Editor, House Beautiful—Home & Field Magazine, 572 Madison Avenue, New York City.

## CLASS I

Best house of 8 rooms and under

First prize .....	\$500
Second prize .....	300

## CLASS II

Best house of 9-12 rooms

First prize .....	\$500
Second prize .....	300

## CLASS III

A special prize of \$300 for the house, of any size, best exemplifying recent developments in construction, materials and architectural design without dependence upon period form. The judges will put special emphasis upon designs that are straightforward expressions of logical plans and upon construction methods that permit a saving in time and expense.

The jury will consist of three members of the American Institute of Architects; Stewart Beach, editor of House Beautiful combined with Home & Field; and Ethel B. Power, who will conduct the competition. The entries will be judged on the following principal points: 1. Excellence of design; 2. Economy in space and convenience and plan; 3. Adaptation to lot and orientation; 4. Skill in use of materials.

The competition closes July 1, 1934, and conditions may be obtained from House Competition Editor, House Beautiful—Home & Field Magazine, 572 Madison Avenue, New York City.

## BRUNSWICK-BALKE-COLLENDER CO. COMPETITION

The application date of the competition for the design of bars, conducted by the Brunswick-Balke Collender Co., has been extended to June 1, and the closing date to July 2.



# IN THIS ISSUE

## THE NEW ARCHITECTURE

By Dr. S. Giedion, General Secretary, Les Congrès Internationaux D'Architecture Moderne

The origin of the New Architecture is traceable to increased mechanization and altered habits and standards. These influences, more or less world wide, have had unmistakable effects upon plan and construction, but their effects upon expression have been obscured by incorporation with theories of art developed outside of architecture. To clarify one's ideas on modern design one must separate what is fundamental from what is bizarre and incidental in current examples of the New Architecture. This is the procedure followed by M. Giedion.

## PORTFOLIO OF CURRENT ARCHITECTURE ABROAD

Pressure to reduce costs has been for some years a universal factor influencing design in all countries. In the search for economies of construction and of upkeep, designers have considered methods of assembly as well as choice of materials, have studied plans for adjustment both to standardized equipment and to habits of use. The selection is in effect a survey of architecture abroad insofar as that architecture is not merely a departure from tradition in art but a sound evolution in response to technological, economic and social developments.

## ELECTRICITY IN THE HOME

By Henry L. Logan, Engineering Consultant

All homes currently planned or replanned (new construction or modernization) should include provision for full electrification in order to avoid premature obsolescence. Reduced current costs are already in effect in some localities and under the compulsion of political as well as competitive trends will be the rule, sooner or later, everywhere. The average total connected load of a six-room house is now less than 3 kilowatts. It is entirely possible that within ten years a six-room house provided with a connected load of "less than 19 to 20 kilowatts will be as unrentable and unsalable as an unwired home is today." The study covers in detail the related subjects of wiring and outlets.

Contributors to the May issue of *The Architectural Record* at a Skiing Party in the Alps. Dr. S. Giedion at left; Marcel Breuer at right.



## NEXT MONTH

### SYMPOSIUM ON CONSTRUCTION CODE OF FAIR COMPETITION

Although the Construction Code has been in effect only since March 2, its practical advantages and disadvantages are becoming apparent. During its formation, all the questions which would come up in operation could not easily be foreseen. As an index to such problems, *The Record* has asked architects and contractors in various parts of the country to express opinions based on their initial experiences with the Code.

### MUNICIPAL BUILDING CODES

In a timely article, "Revise Building Codes Now," William Lynch Murray (Harrisburg, Pennsylvania, architect) points out that obsolete building regulations are in force in most localities. These codes should be revised to meet the standards set by scientific performance tests.

### MODERNIZATION AND ALTERATION

A diversified and well-illustrated series of remodeling projects has been selected for the Portfolio on Current Architecture.



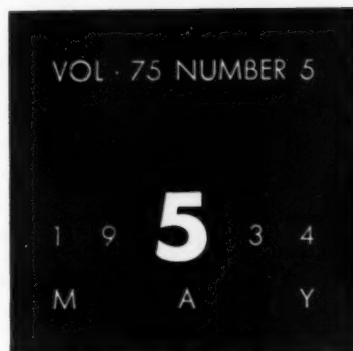


WINDOW DETAIL, HOUSE AT WEISBADEN, GERMANY

Marcel Breuer, Architect

ALL WINDOWS FACE SOUTH AND WEST BECAUSE IN THIS DIRECTION ONE ENJOYS FULLY THE GARDEN, THE SUN AND VIEWS OF THE RHINE VALLEY. IN THE AUTUMN, WINTER AND SPRING THE SUN, SHINING THROUGH LARGE GLASS AREAS, HELPS TO HEAT THE ROOMS. IN SUMMER THE WINDOWS ARE PROTECTED BY REMOVABLE AWNINGS. THESE ARE PLACED 8 INCHES FROM THE WALL TO PERMIT ESCAPE OF HEATED AIR REFLECTED FROM WALL SURFACES.





# **T H E ARCHITECTURAL RECORD**

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## WHAT SHOULD BE DONE TO IMPROVE ARCHITECTURAL EDUCATION?

**BY DR. S. GIEDION**

GENERAL SECRETARY OF THE  
INTERNATIONAL CONGRESSES  
FOR NEW ARCHITECTURE

There are increasing complaints by architects and others that the courses of study in the architectural schools do not satisfactorily prepare the practitioner for today's problems. As explanation we may say that the distance is becoming greater and greater between what is being taught and what the young architect is called upon to solve and to do in actual practice. Notable physicians, chemists, engineers, have been trained in technical schools and universities but their training has had the advantage of a close teaching contact with outstanding and experienced men in their fields.

The leaders of contemporary architecture in Europe, with very few exceptions, did not receive academic architectural training in universities. This is no reflection on schools as a suitable place for educating the architect. It indicates a lack of progress in existing training as compared with very definite scientific progress pertaining to methods of living and working and with respect to construction methods and materials. The real leaders in contemporary architecture are mostly outsiders who were obliged to develop independent thinking as a means of expanding their professional responsibilities. Certainly the university trained architect is able to get rid of unfruitful knowledge, but the great majority is hopelessly trained in the wrong way. *The most important aid to the continuous development of architecture is an approved and broadening education of the young student.*

We know that, in present day life, it is not the number of inventions nor production totals that are important to the proper functioning of a community and the well-being of all classes of citizens. It is rather the ability to absorb the inventions and productions sensibly, economically and politically. Our lack of historically formulating power is revealed by the fact that for a century, that is, since the conception of modern industry, we have not succeeded in creating a new form of living which is in step with advances in social science, medical science and building methods. The claim of contemporary architecture is to broaden the general interest in housing and community arrangement beyond professional circles. *The new architecture would take advantage of scientific progress so as to attain new possibilities for greater human comfort.* The new architecture is attempting to apply, in its own field, *a sensible use of technical invention and production for the creation of a more healthful, pleasant and homogeneous form of life.*

This use of technical invention and production for a new homogeneous life demands leaders of real creative ability because nothing is more difficult than to detour from the wrong track to the right one. The education of the young architect should obviously be placed in the hands of architects who have professional experience and leadership and not in the hands of men of secondary ability or individuals who have not kept up with a knowledge of new needs or who are merely clever imitators.

Contrary to common practice in medicine, chemistry, physics and engineering, Boards of Selection have not been inclined to appoint advanced practitioners for teaching architecture. For what reason? It is because architecture appeals strongly to sentiments; and these sentiments in favor of traditional architecture have swayed school authorities.

The following proposals are made with a conviction that their application would aid in attaining a correct transformation of architectural education and a useful training of the student-architect:

Appointment of architects of outstanding experience and technical ability as professors of the important schools of architecture. For example, would not an experienced educator and creative head such as Walter Gropius be very helpful for the reorganization of architectural schools of America? Those productive architects who are aware of general conditions and are able to judge the value of knowledge and training in special fields should be given supervision of separate departments of architecture.

Scientific education (mechanics, mathematics, construction methods, and so on) could in most cases be taken over from the existing teaching framework; with, perhaps, a more pronounced specialization in architectural requirements.

Special attention should be given to well defined and applied knowledge of *construction materials* because the architect should be accustomed to clearly transmit, very early, his problems to the industry which produces each building part. In the future the cooperation between architects and manufacturers must be closer, in order that the architect not only passively accepts what industry produces, but

also influences from the very beginning the production through requirements which are in accordance with a favorable architectural development.

For the *general education* of the architect it is essential that he acquires knowledge of pertinent facts about economics, trade codes and financing. The architect should be informed of economic systems, the essentials of social orders, and the functioning of groups and classes within cities and states; but these subjects should be taught with consideration of their relation to architecture.

*Architectural history* need not be eliminated from the educational program. The usual teaching of *history of art*, however, by reviewing superficially all the periods, has not been proved satisfactory. It may be that one specific building problem should be studied through the various periods or a single period only could be treated exhaustively.

As important as the knowledge of early periods of architecture would be an acquaintance with the origin and evolution of building of our own time or since the end of the eighteenth century. This would inform the young architect of a real tradition, the tradition on which he stands. It would give him ample justification and courage for his own activity. One might add that the student should be kept informed of what is happening in architecture all over the world. The horizon for the student would thus be broadened to his advantage.

Progress lies in the future. The question therefore arises whether a world congress on architectural education could be called together in the United States. Such a gathering would be of value to all who would participate. The members of the "International Congresses for New Architecture," consisting of leaders and students, would take great pleasure to assist such a congress.

IN EUROPE some experiments have been tried in advanced architectural education. There is the notable instance of long activity by Professor Karl Moser at the Polytechnic Institute in Zurich. To him we are appreciative for the well trained architectural graduates that practice today in Switzerland. In Stockholm the experienced architect, E. Asplund, the planner of Stockholm's building exposition in 1930, was appointed as instructor in architecture two years ago. At the Institute of Technology in Charlottenburg, Germany, the housing architect, Bruno Taut, has been active until the coming of the National Socialists. In Russia there are Alexander Wesnin and Ladowski. An outstanding accomplishment has been the founding of the "Bauhaus," 1919 at Weimar, Germany, by Walter Gropius. Under its original constitution the "Bauhaus" was not classified with universities. It was an independent school which, for the first time, systematically developed a new building and housing culture by the correct training of the student for urgent contemporary problems. In France architectural education is proceeding in ateliers. Those of the brothers Perret and of Le Corbusier have done more for the education of the young architect than all the schools of France together.





*Albert Frey*

INDIAN PUEBLO AT TAOS, NEW MEXICO

A native American architecture is found in the pueblos of Indians of the Southwest. These buildings for dwelling purposes exhibit an unusually well balanced harmony of living requirements, structural methods and formal expression. There are no parts that exist for purely sentimental or decorative purposes. At the same time essential needs are expressed with a refined knowledge of appearance. Such architecture is at once timeless and modern.

A CALIFORNIA BUNGALOW



HOUSE OF MARY BANNING,  
LOS ANGELES, BUILT IN  
1911.  
IRVING GILL, ARCHITECT



In certain contemporary American architecture we discover forms that are strikingly similar to the Indian pueblos of New Mexico. With a natural architecture the form is a consequence of planning requirements and structural methods. In the three cases illustrated there is a grouping of rooms for dwelling purposes. Since a cube represents the most compact and practical shape for a room, we can expect the economical grouping of such rooms to result in a rectangular composition.

# THE STATUS OF CONTEMPORARY

**O**URS IS A PERIOD OF TRANSITION. THERE IS TODAY A MIXTURE OF THE PRACTICE OF THE PAST AND NEW TRENDS. THIS EPISODE OF CHANGE IS NOT NEW. IT HAS BEEN GOING ON FOR OVER A CENTURY. EVERY COUNTRY IS BEING AFFECTED, USUALLY AT THE RATE OF ITS INDUSTRIAL PROGRESS. INDUSTRIALIZATION HAS ALTERED OUR FORMER SOCIAL AND ECONOMIC EQUILIBRIUM. THERE EXISTS A MOVEMENT WHICH SEEKS A TRUE EXPRESSION OF THE NEW METHODS IN CONSTRUCTION AND PLANNING WITH THE AIM OF ACCOMPLISHING A NEW HARMONY OF OUR LIFE AND ACTIVITIES. LET US REVIEW BRIEFLY THE ACTUAL STATUS OF CONTEMPORARY ARCHITECTURE IN THE DIFFERENT COUNTRIES.

## FRANCE

In the 19th century engineers in France erected great structures, giving no evident consideration to aesthetic appearance. Through the example of anonymous engineering structures a new sentiment has unconsciously arisen. Modern painting was first to attain a new language in expressing the new sentiment. Great architects like Perret and Tony Garnier introduced the new methods to all kinds of building without enunciating, however, their complete formulation. Later on LeCorbusier developed further the new vocabulary. His preoccupation with painting accelerated his conception of new forms.

## HOLLAND

In 1917 the creative architects of this country combined ideas in a magazine, "De Stijl," with contributions from foreign architects, including Frank Lloyd Wright and Sant Elia. The initiator was Theo van Doesburg with Oud, Rietveldt, van Eesteren and others. Holland was the first country to change its aspect by the building of garden cities with roof terraces, large windows and a garden setting. It also was the first country to set up the exact requirements for low-cost housing.

## BELGIUM

About 1920 Victor Bourgeois started the new movement for Belgium by the construction of a garden city for the working class.

## SWITZERLAND

The first examples of new architecture appeared in Switzerland in 1924. Its recognition and practical application have steadily grown, and today the new trend includes house furnishing and industrial design.

## SCANDINAVIA

Sweden, Norway, Denmark and Finland cultivated a neo-classic tradition during the opening years of the twentieth century. This influence spread abroad to England, Germany and the United States and hindered for a period the natural development of modern architecture. However, since the Stockholm exposition in 1930 and notable contributions for group housing, the building of a network of new cooperative stores and also factories, there has been much progress and an official acceptance of contemporary architecture.

## GERMANY

Walter Gropius, before 1914, did much to attain a clear expression for German architecture. Greatest progress was made from 1927 to 1930. Architecture in Germany since 1932 has been subjected to so much regulation as to threaten the progress made during the past twenty years.

## POLAND

Its architects have cooperated as a group to solve low-cost housing for Poland. Consideration is given to the special requirements of that country.



# ARCHITECTURE

BY DR. S. GIEDION

After a number of premature experiments between 1927 and 1929, experiments mostly modernistic and executed with unsolved construction methods, there is a reaction in favor of classical styles. It is not possible to predict any issue at the present moment but there are results in modern city planning which the Russians are evolving and which are of international importance.

U. S. S. R.

This country has the most highly developed building technique, it erects the highest buildings, it possesses one of the greatest pioneers of modern architecture—Frank Lloyd Wright; but until recently, America has given little attention to the application of technical knowledge to an architecture suited to its advanced methods and new materials. With difficulties confronting the building industry during the depression there has been an awakening of interest in housing for the lowest income group. America has sent during the last few years a great number of architects and sociologists to Europe for the study of these new requirements. It seems now that a new architectural approach is developing.

U. S. A.

Some forty years ago England set an example for other countries in building houses for the nonprivileged classes. After a long period of delay, and with the stimulus of new architectural training, there is a new and widening circle of activity in producing a new and useful architecture.

ENGLAND

In the nineteenth century these countries employed results which had previously been verified by the Northern countries. In Barcelona, the beginning of unexpected developments is now noticeable. At the site of the 1929 Exposition garden cities are now planned for 30,000 inhabitants of the working class. The close cooperation between the government and the architects in charge is favorable to both of them. In its industrial buildings, stadiums, etc., Italy possesses all of the elements necessary for the development of a contemporary architecture. Like Sweden, in 1930, it has taken an official step towards new realizations by the "Triennale 1933" at Milan.

SPAIN

ITALY

Algeria, which confronts urgent problems in city planning, is furthering new solutions.

ALGERIA

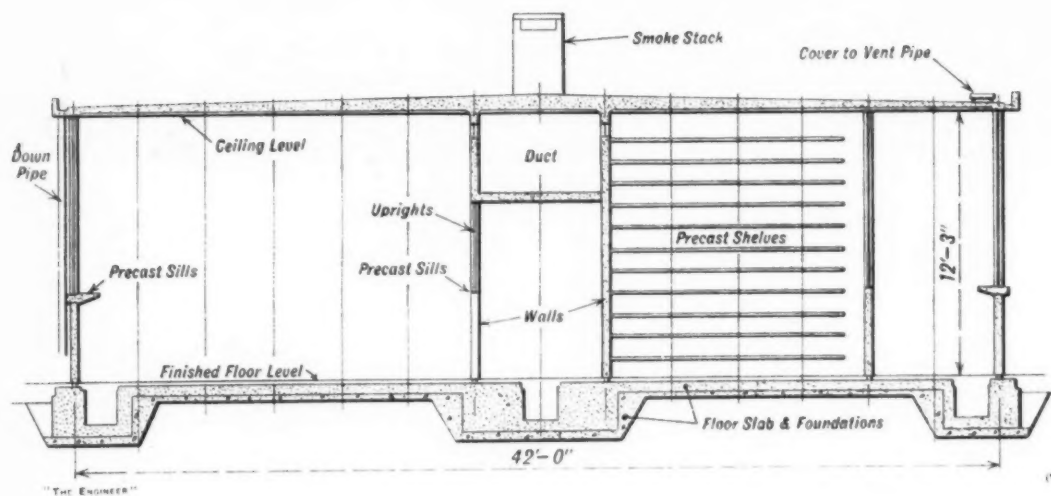
Greece shows much interest in the modern movement and there is no doubt that an evolution in such a magnificent setting can give best results by the continuation of tradition in a truly modern way.

GREECE

## IN THE FOLLOWING SECTION IS A REPRESENTATIVE SELECTION OF EXAMPLES OF CONTEMPORARY ARCHITECTURE FROM NINE COUNTRIES P O R T F O L I O

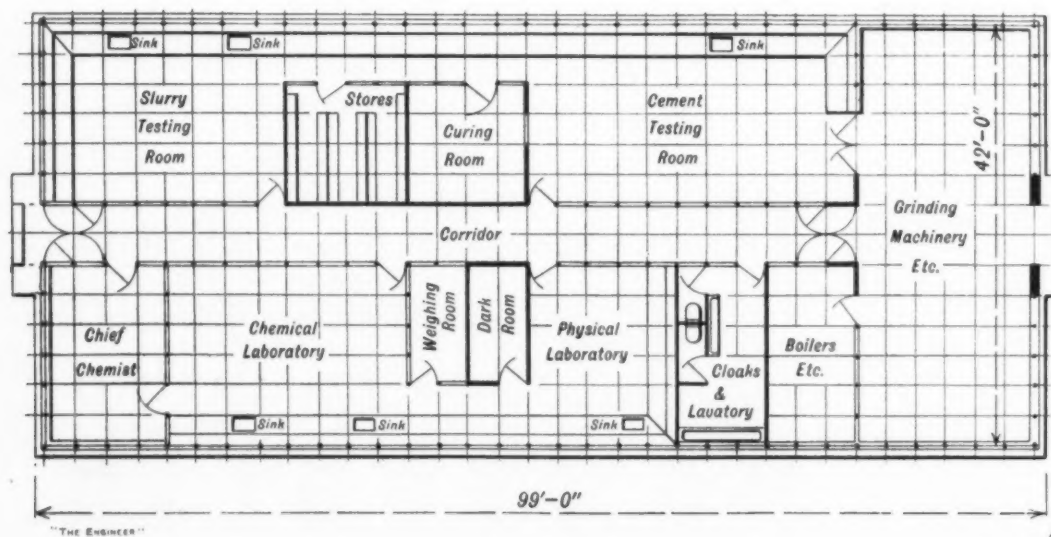


WEST END,  
SHOWING ENTRANCE



CROSS SECTION  
OF LABORATORY

Window frames, sills and wall units are of precast concrete sections. Shelves for storage are of precast and reinforced concrete one and one-quarter inches thick.



PLAN OF LABORATORY

The building is constructed to a unit dimension of three feet. Corridor width and room sizes are multiples of three feet. Window frames of concrete are three feet on centers.



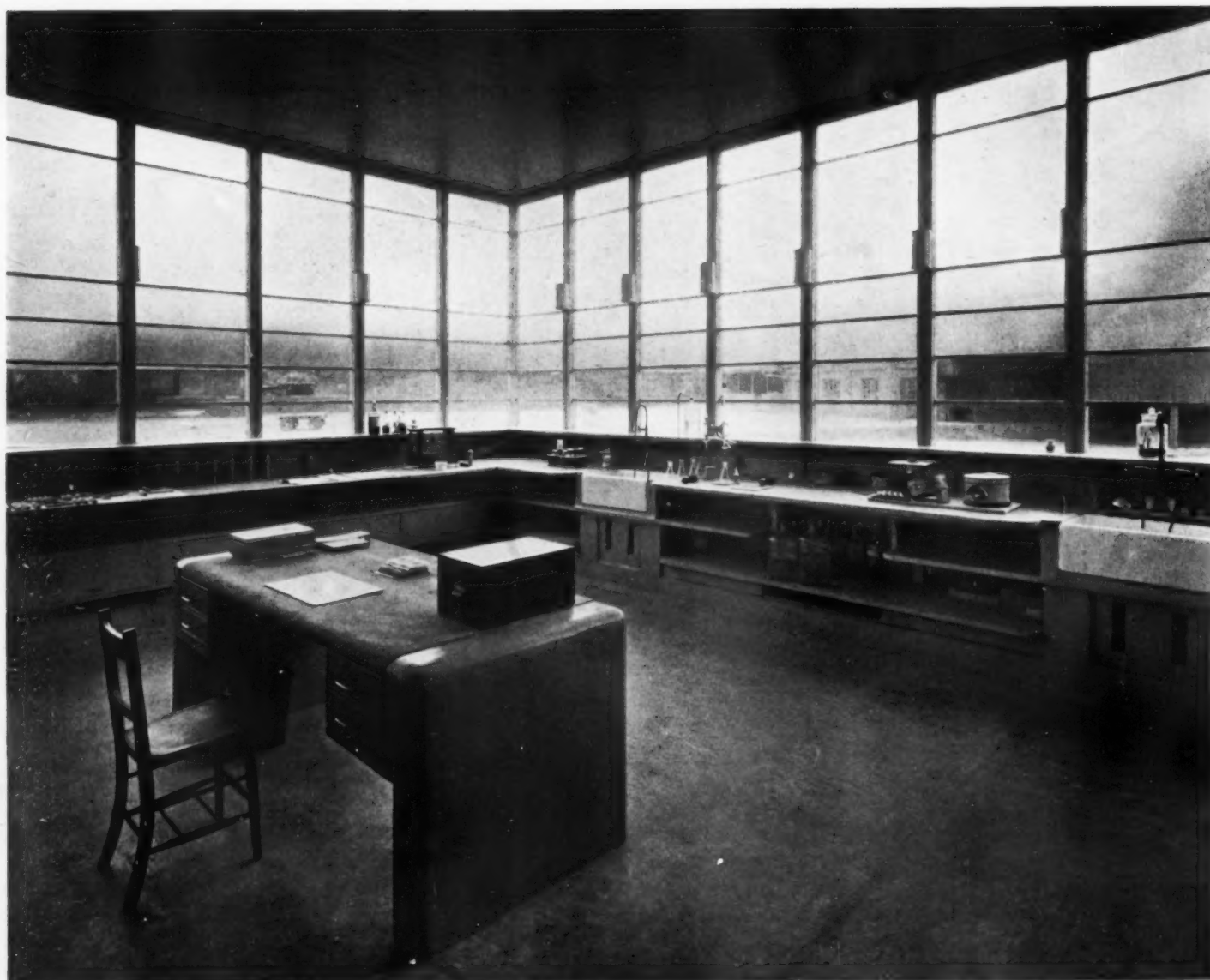
*Sims*

NIGHT VIEW WITH ILLUMINATION TO GIVE DAYLIGHTING CONDITIONS

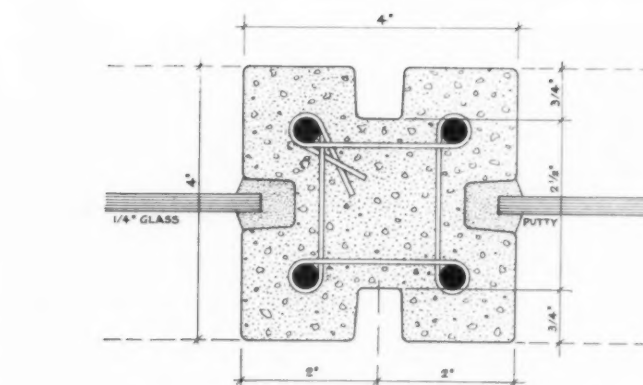
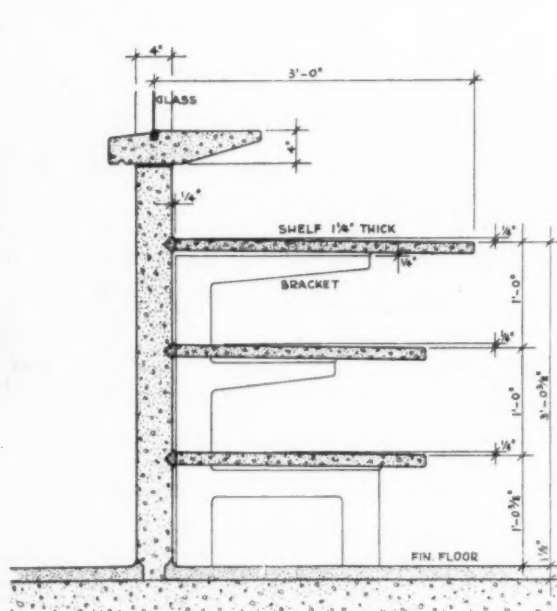
## AN ALL-CONCRETE LABORATORY, ESSEX, ENGLAND

DESIGNED BY SIR E. OWEN WILLIAMS

This laboratory building was designed for the Tunnel Portland Cement Company, England. It is used as a chemical laboratory for testing cements produced by the firm. The construction is of interest because every possible part of the structure, even including shelves, cupboards and desks, is of reinforced concrete. The building is one story high, provided with a flat roof, supported by four-inch square posts. These posts are spaced three feet apart. The building length is ninety-nine feet and the width is forty-two feet. Window glass is mounted in three-quarter-inch slots in side of posts. Slots in face of posts are used to house supports for electrical fittings. Fresh air is delivered to every room by an air duct above corridor. Used air is delivered outside by ducts beneath corridor and at outer wall. The extensive shelving used for storage is partly precast and partly built in place. The roof is of slab construction with underside faced with cork for insulation.



Sims  
INTERIOR OF ALL-CONCRETE LABORATORY



ABOVE: SECTION OF FOUR-INCH CONCRETE POSTS, SPACED THREE FEET ON CENTERS FOR WALLS. GLASS IS SET IN GROOVES WITH PUTTY.

LEFT: DETAIL OF SHELVING UNDER WINDOWS. SHELVES ARE ONE AND ONE-QUARTER INCHES THICK, PRECAST AND SUPPORTED BY CONCRETE BRACKETS. THE CAST WINDOW SILLS ALSO SERVE AS SHELVING.



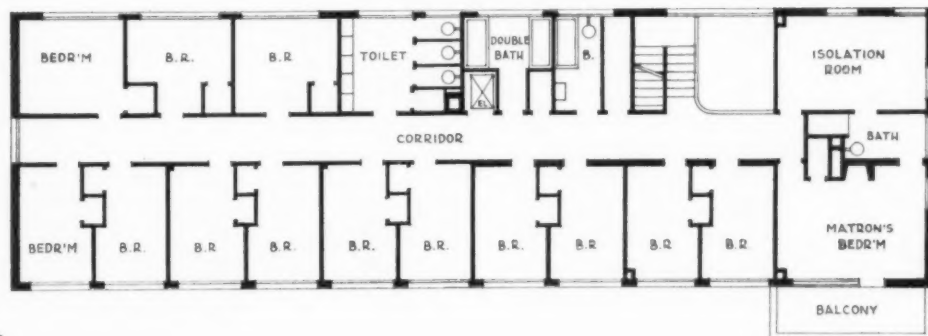


*Sims*  
CONCRETE STORAGE SHELVES



Moss

INTERIOR OF COMBINED DINING ROOM AND LOUNGE



DORMITORY ROOMS ON SECOND FLOOR



GROUND FLOOR PLAN

1 5 10 20 30 40 50 60 FT



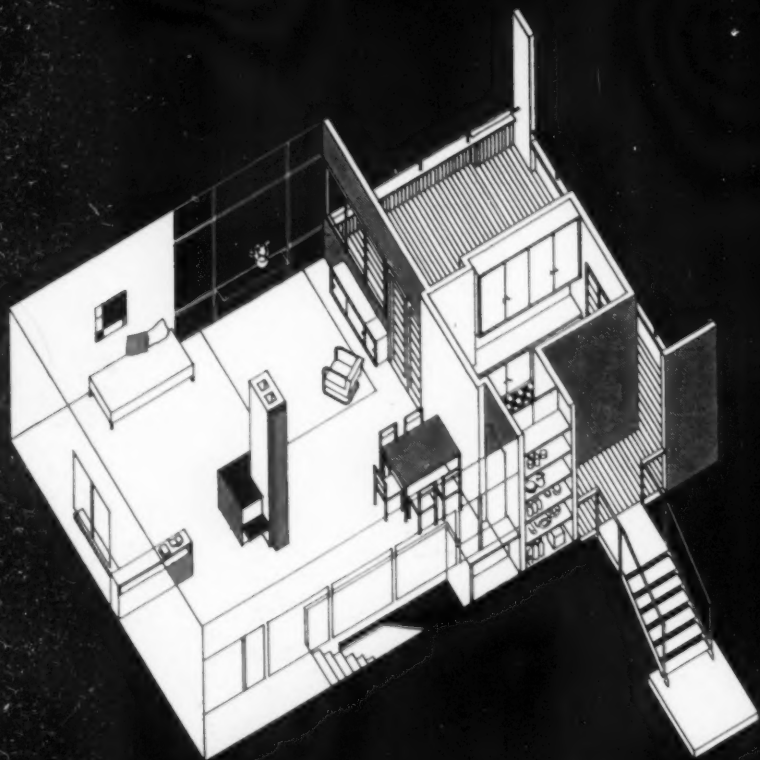
Moss

GENERAL VIEW OF EXTERIOR

# THE DARTINGTON COUNTRY SCHOOL SOUTH DEVON, ENGLAND HOWE AND LESCAZE, ARCHITECTS

A boarding school for boys. The school was placed in a rural setting, surrounded by Devonshire farms and woodlands. Cultural education supplements training in countryside activities; gardening, forestry, weaving, building, clay potting and firing. Agriculture is conceived of as an industry and a life work. The London Architectural Review (article by Gerald Heard) summarizes the aims of Agriculture: "producing goods, paying its way and giving its constituents a sense that the organization is not only their means but their end; not only their livelihood, but their life's purpose." The new architectural form does not suffer from its naturalistic setting, in fact the orderly character of the architecture is suited to its inclosure of trees.

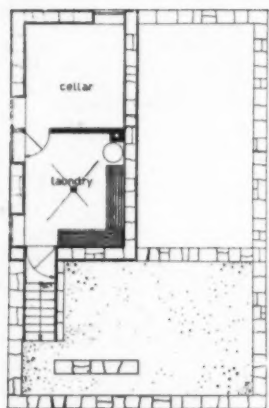
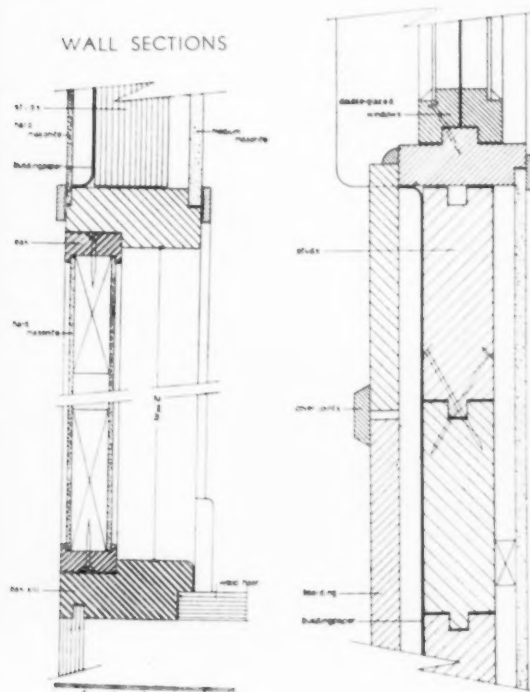




## SUMMER HOUSE NEAR GÖTEBORG, OF WOOD CONSTRUCTION

ALFRED ROTH AND INGRID WALLBERG,  
ARCHITECTS

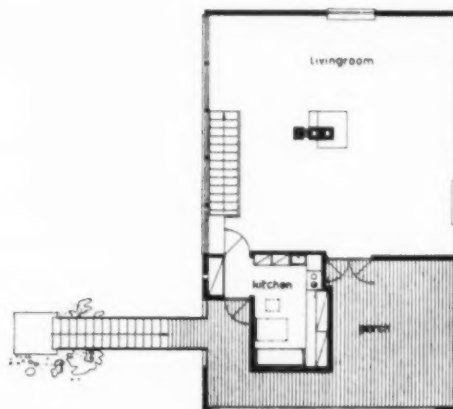
WALL SECTIONS



BASEMENT



FIRST FLOOR

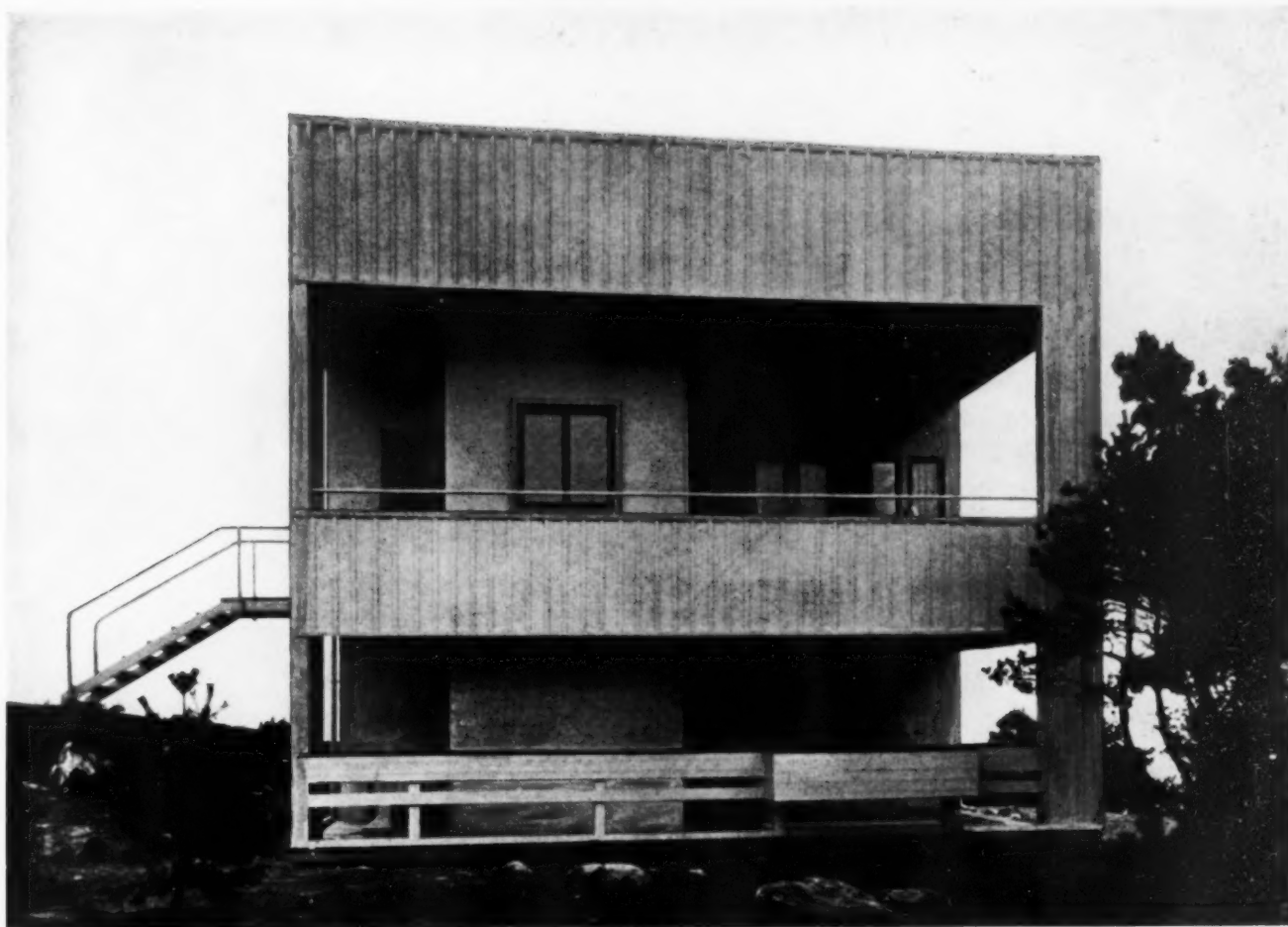


SECOND FLOOR

This house was built for a tradesman of moderate income. It is situated on a rocky promontory overlooking the water. A large living room is placed on an upper level for quietness and view. The bedrooms on the first floor are separated by closet units. There are no doors, excepting for exterior entrance. Curtains are used as a substitute for doors. Exterior structural walls are of heavy planks, tongue and grooved, and placed vertically. The outside facing is of light boards and battens. Interior walls are lined with Masonite insulation board.







ABOVE, ELEVATION TOWARD VIEW

BELOW, INTERIOR OF LIVING ROOM

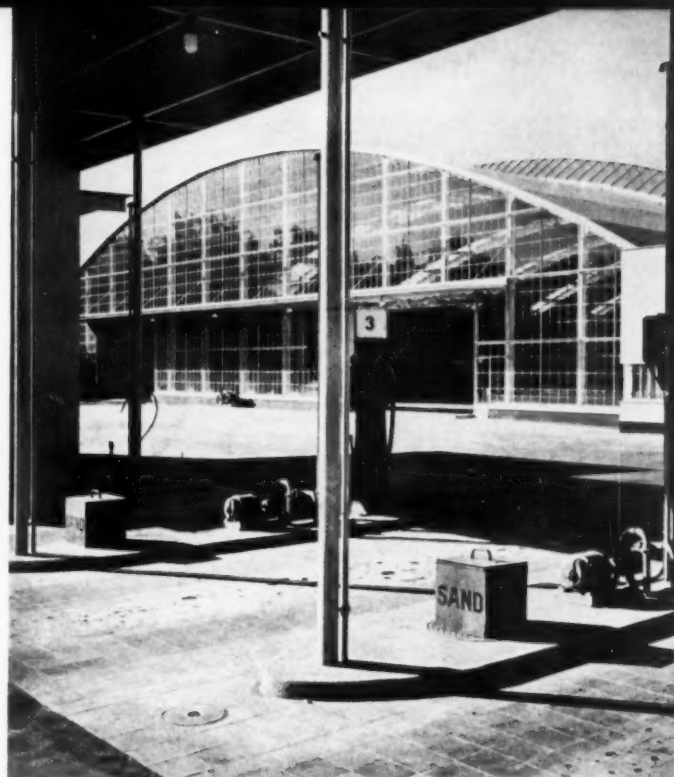




## AUTOBUS TERMINAL AND GARAGE STOCKHOLM, SWEDEN

ESKIL SUNDAHL, ARCHITECT

Space is provided for 250 autos, a repair shop and power plant, gasoline station and administration offices. Garage space and shops can be enlarged to double the existing capacity. There is an unobstructed parking area for buses lighted from overhead. Columns were omitted because they hinder a free movement of cars and it is impossible to anticipate exactly the sizes of buses of the future. To permit the free entrance of two-story buses, the doors were made sixteen feet high. The roof is framed with continuous steel girders forming an arch that extends beyond the side walls. The ends of the garage hall are entirely of glass with steel frame. The building was erected on a huge slab of concrete, which in turn is supported on piling, shown on the drawing of the section on the opposite page.



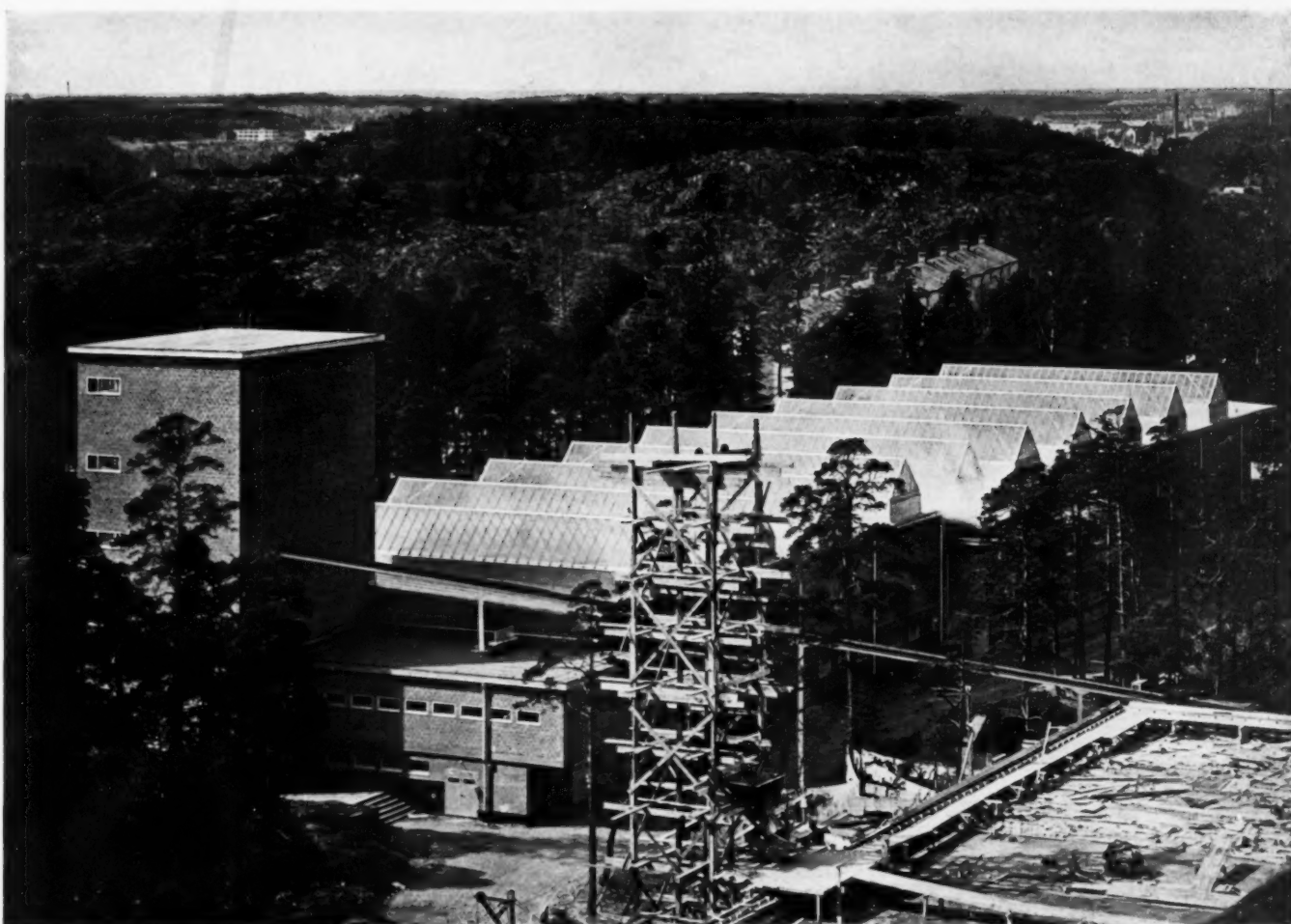
*Rosenberg Photos*











Rosenberg Photos

## CRACKER FACTORY (COOPERATIVE), STOCKHOLM, SWEDEN

ESKIL SUNDAHL AND OLOF HULT, ARCHITECTS

This factory manufactures a Swedish hard bread and is situated near the grain elevators of the City of Stockholm. The site of the factory is a wooded island and the selection of location was influenced by a desire to obtain a natural beauty of setting to contrast with the well organized shape of the factory group. The general plan consists of a large factory floor daylighted by saw-tooth skylights, a tower for storage of ground meal, a power plant, a small dining room for workers, toilets and lockers. The entire plant is supplied with conditioned air. Because of this mechanical ventilation it was possible to use a skylight with fixed sash. This minimized the usual objection to overhead glazing, namely, its liability to leakage.

LEFT: Interior of Autobus Terminal near Stockholm, Sweden. Eskil Sundahl, architect. There is unobstructed space for free maneuvering of cars. Skylights and a wide expanse of glass at end walls give outdoor daylighting conditions.



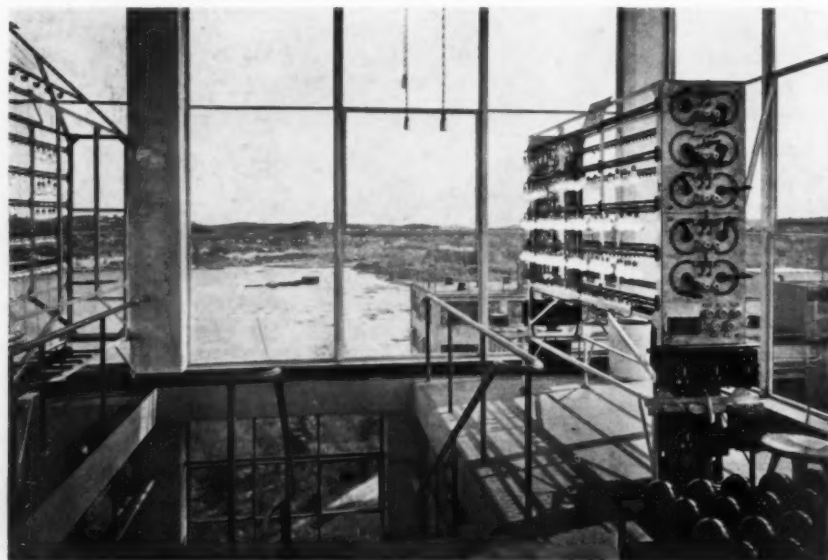


Rosenberg Photos

## "LUMA," ELECTRICAL LAMP FACTORY (COOPERATIVE), STOCKHOLM

ESKIL SUNDAHL AND ARTUR VON SCHMALENSEE, ARCHITECTS

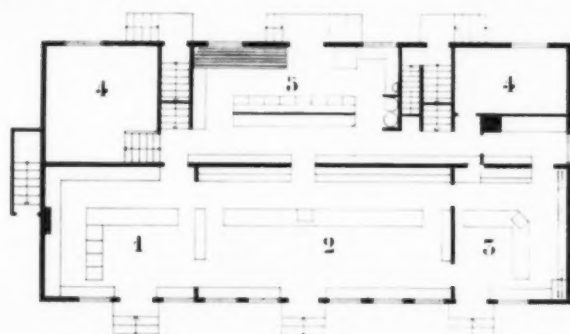
GENERAL VIEW OF FACTORY, SITUATED ON A WOODED ISLAND NEAR STOCKHOLM. THE GLAZED-IN ROOM AT ROOF LEVEL IS USED AS A TESTING ROOM AT NIGHT. THE ILLUMINATION OF THIS BUILDING IS ONE OF THE MOST FAMILIAR SIGHTS OF STOCKHOLM.



INTERIOR VIEW OF LAMP TESTING LABORATORY



INTERIOR VIEW OF GROCERY STORE, SHOWING BUTCHER SHOP THROUGH GLASS DOOR.



## COOPERATIVE COMMUNITY STORES NEAR STOCKHOLM

ESKIL SUNDAHL AND OLOF THUNSTROM, ARCHITECTS

LEFT—FLOOR PLAN SHOWING GROUPING OF DEPARTMENTS: (1) BAKERY; (2) GROCERY; (3) BUTCHER SHOP; (4) MISCELLANEOUS; (5) STORAGE.

BELOW: EXTERIOR VIEW OF STORES FROM STREET WITH ENTRANCES TO EACH DEPARTMENT. APARTMENTS OF STOREKEEPERS ON SECOND FLOOR.



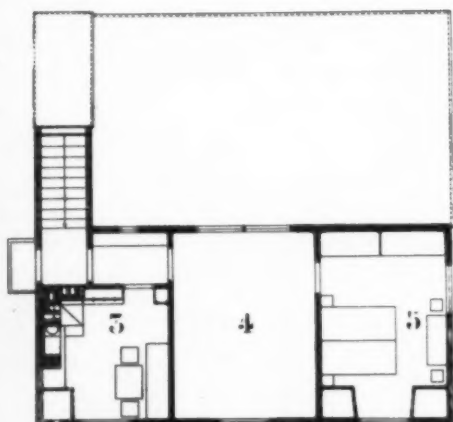




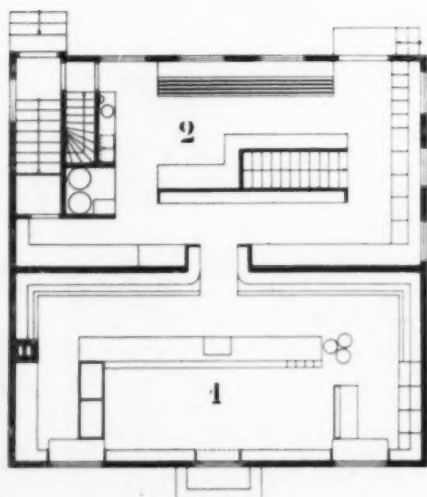
GENERAL VIEW OF STORE

## STANDARDIZED TYPE OF COOPERATIVE COUNTRY STORE

ESKIL SUNDAHL AND OLOF THUNSTRÖM, ARCHITECTS



SECOND FLOOR PLAN WITH APARTMENT OF MANAGER: (3) KITCHEN; (4) LIVING ROOM; (5) BEDROOM



FIRST FLOOR PLAN:  
(1) STORE AND DISPLAY  
(2) STORAGE ROOM

0 10



INTERIOR OF STORE



INTERIOR OF STORAGE ROOM



SWEDEN



# A PUBLIC RESTAURANT HELSINKI, FINLAND

P. E. BLOMSTEDT, ARCHITECT

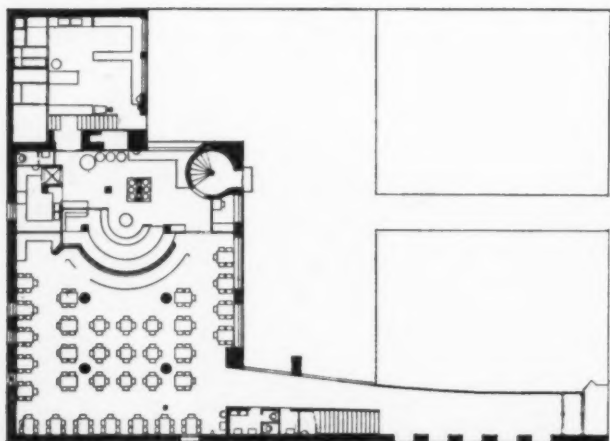
CAFETERIA DINING ROOM

RESTAURANT SERVICE UPSTAIRS

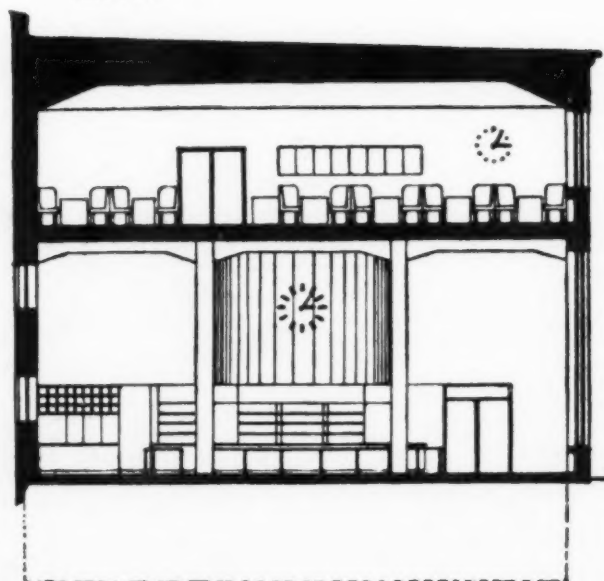


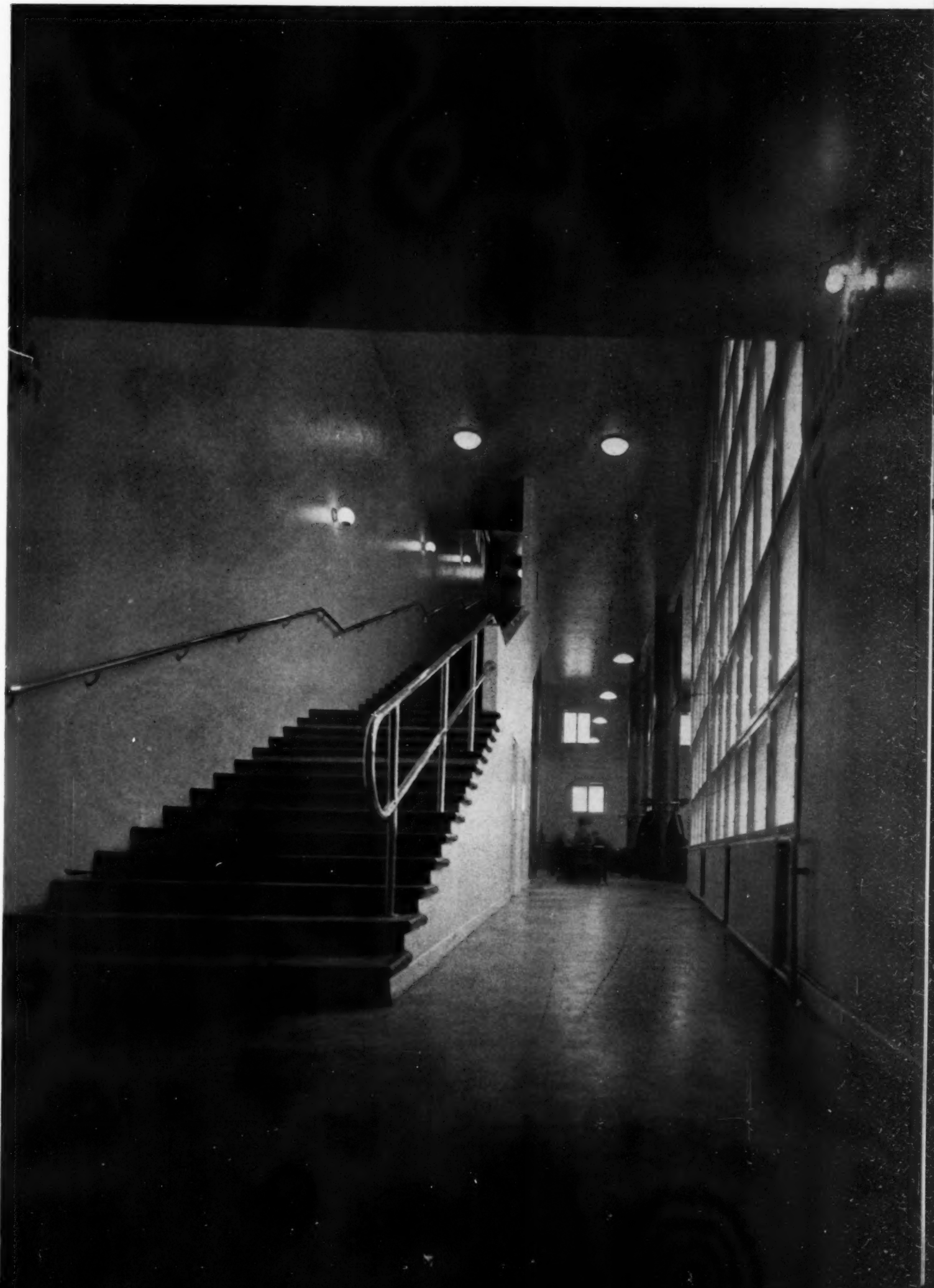
*Iifland Photos*

PLAN



SECTION









*Hand Photos*

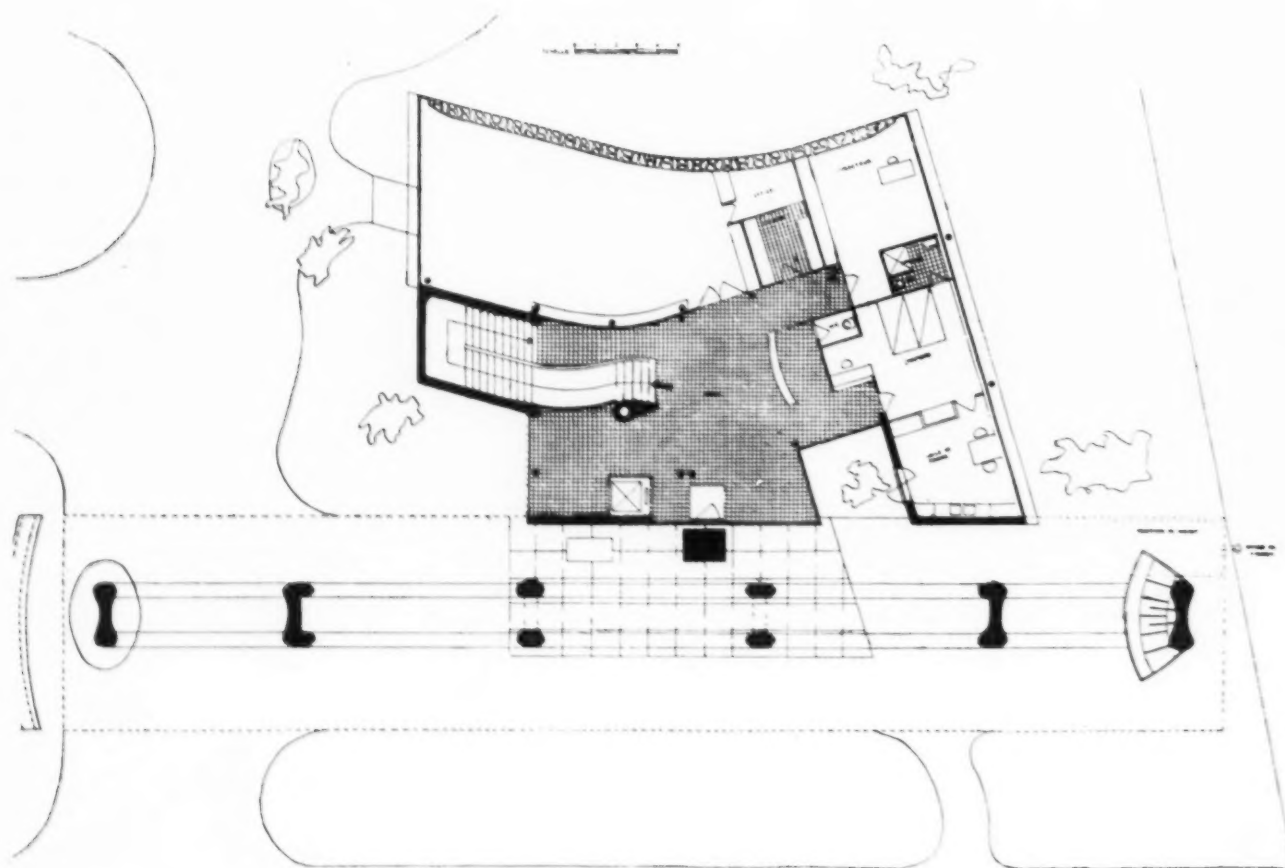
COUNTER FOR CAFETERIA SERVICE  
P. E. BLOMSTEDT, ARCHITECT

OPPOSITE PAGE—VIEW TOWARD CAFETERIA DINING ROOM

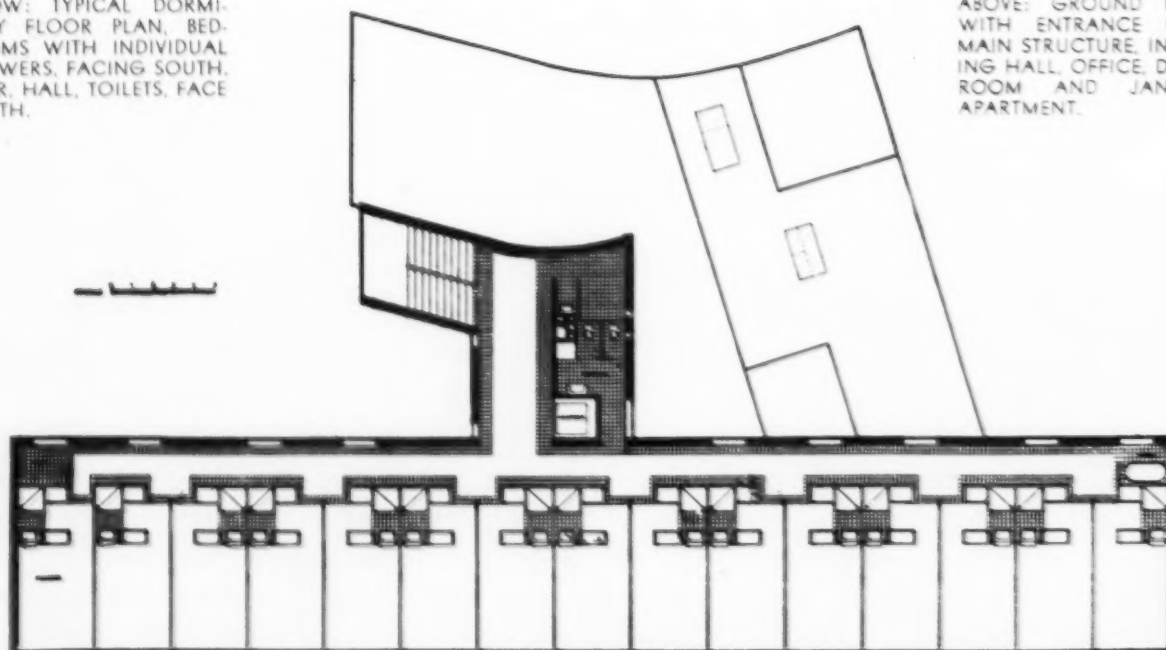


# SWISS PAVILION, CITE UNIVERSITAIRE, PARIS

LE CORBUSIER AND P. JEANNERET, ARCHITECTS

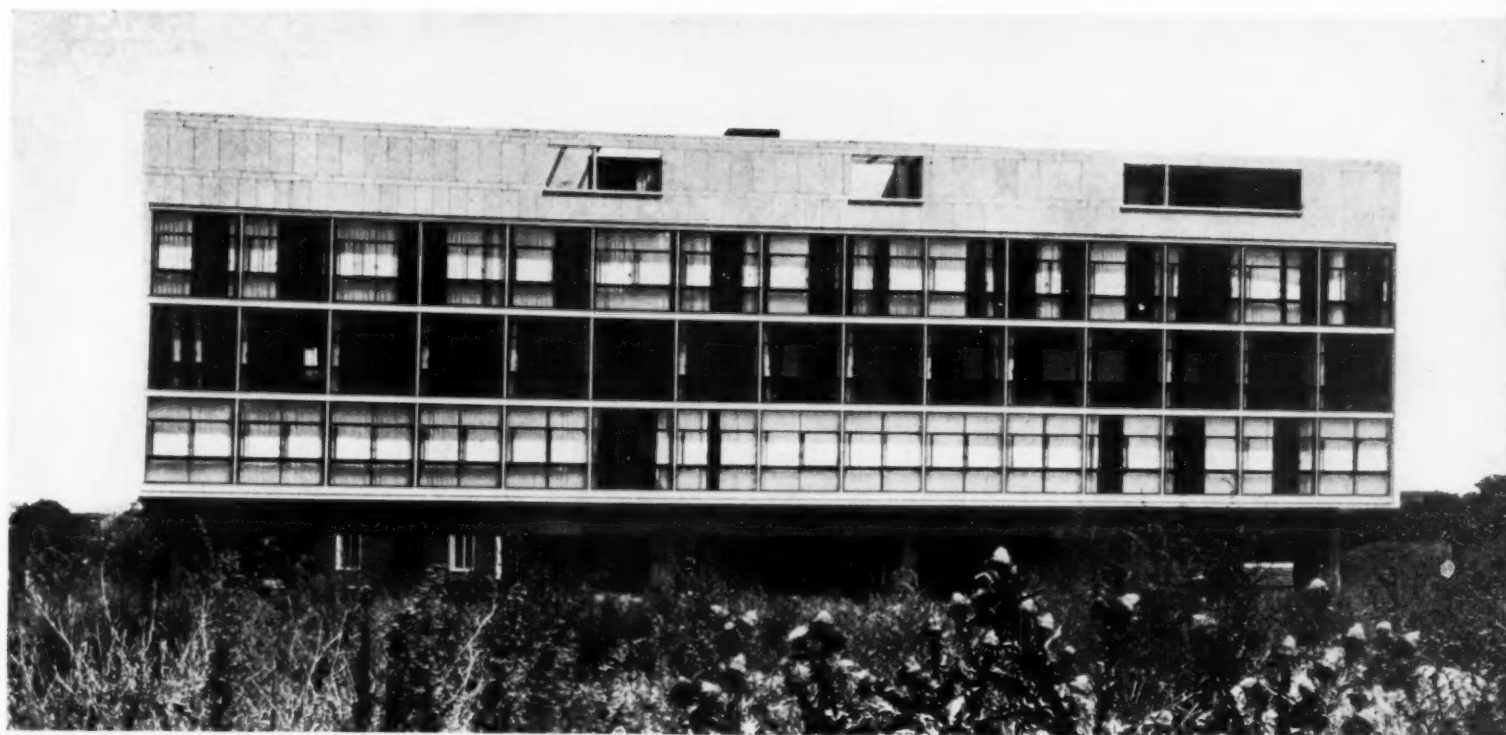


BELOW: TYPICAL DORMITORY FLOOR PLAN, BED-ROOMS WITH INDIVIDUAL SHOWERS, FACING SOUTH, STAIR, HALL, TOILETS, FACE NORTH.



ABOVE: GROUND FLOOR WITH ENTRANCE UNDER MAIN STRUCTURE, INCLUDING HALL, OFFICE, DINING ROOM AND JANITOR'S APARTMENT.





Gravot

SOUTH ELEVATION OVERLOOKING FUTURE ATHLETIC FIELD AND PARK. EACH GLASS-SQUARE REPRESENTS ONE BEDROOM WITH SUNLIGHT CONTROLLED BY BLINDS

## SWISS PAVILION, CITE UNIVERSITAIRE, PARIS

LE CORBUSIER AND P. JEANNERET, ARCHITECTS

The Cité Universitaire is a group of National Pavilions at the outer perimeter of Paris, providing shelter for students from all over the world who are studying in Paris. These pavilions were designed, with one exception, in national styles exhibiting architectural clichés of Greece, Germany, Holland, France, Cuba, United States, Argentine and Japan. Switzerland alone is represented by a thoughtfully designed structure with two clearly articulated units. The dormitory is four stories high, raised twelve feet above the ground on pairs of concrete columns. On the side facing the future athletic field of the Cité Universitaire, the lower three stories are faced entirely with glass. The remainder of the building is faced, excepting for minor fenestration, with precast concrete slabs. The columns support, by cantilevers, a concrete slab on which the superstructure rests. The footings for the columns extend down to a depth as great as the height of the building. This was a structural necessity because the building was erected on filled ground, over a stone quarry. The second unit contains commons' rooms, offices for the director, a library, and a caretaker's apartment. The stair-well provides vertical circulation by elevator and stairways with the outer wall entirely of structural glass. The building is of interest because it exemplifies an extensive use of dry construction with prefabricated materials, including cast concrete wall units, glass blocks and partition sections. Color was employed to differentiate the control and use of rooms by student groups from counties of Switzerland.



SWISS PAVILION — CITE  
UNIVERSITAIRE, PARIS.  
LE CORBUSIER AND  
P. JEANNERET, ARCHITECTS

VIEW OF CONCRETE COL-  
UMNS SUPPORTING PAVILION.  
CARETAKER'S APARTMENT TO  
THE RIGHT.



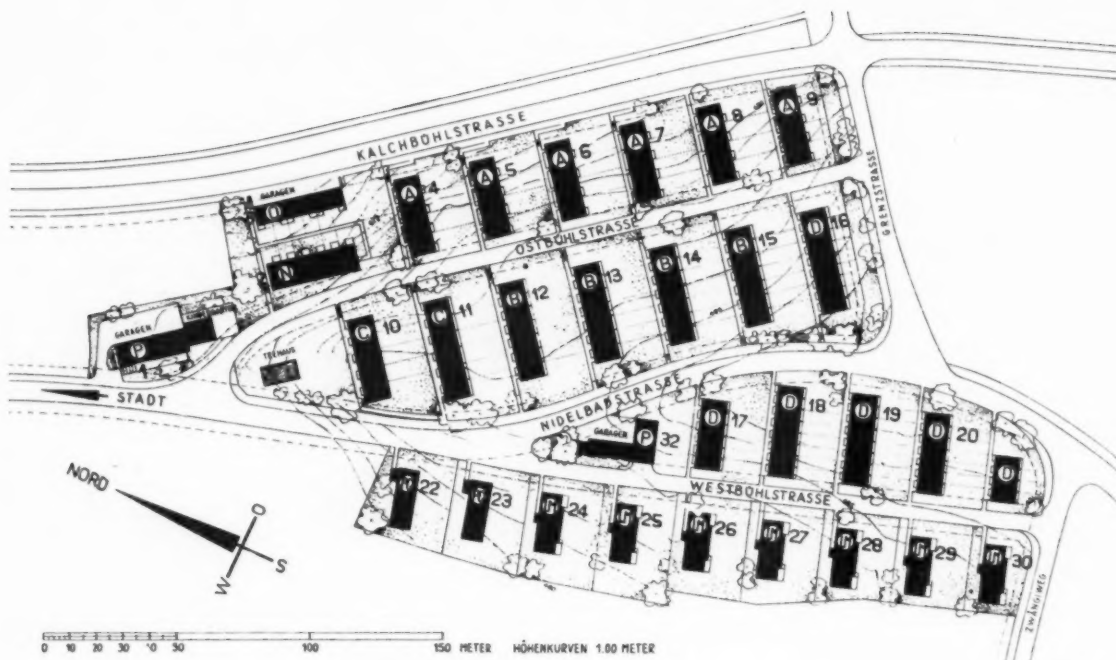
SIDE VIEW, SHOWING GARDEN  
EXTENDING UNDER BUILDING  
BLANK END WALL OF PAVIL-  
ION AND AT LEFT, STAIR-  
TOWER FACED WITH STRUC-  
TURAL GLASS BRICK.



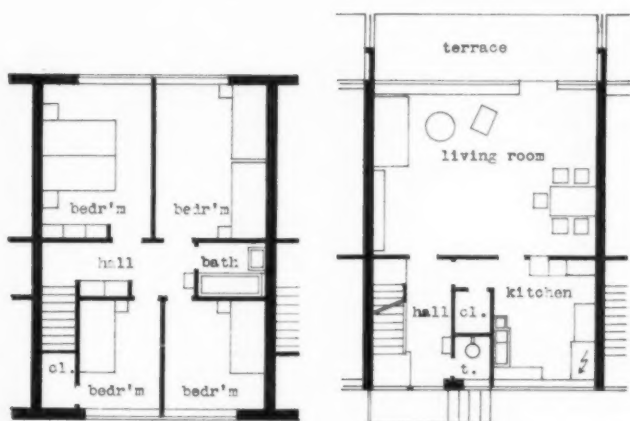
DINING AND READING ROOM. SLIDING GLASS DOORS AT END OPENING TO THE GARDEN. PHOTOMURAL ON WALL TO THE RIGHT. DINING TABLE OF MARBLE SLAB SUPPORTED BY TWO POSTS. CEILING OF ACOUSTICAL TILE. **BELOW:** SHELTERED TERRACE FOR SITTING AND READING. ENTRANCE TO HALL AT RIGHT.







Bauwelt

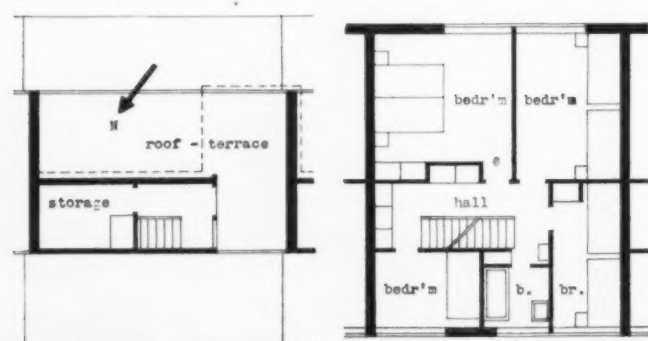


PLOT PLAN OF "NEUBUEHL," ZURICH  
Buildings are oriented so as to receive sun on two or more sides.

FIRST AND SECOND FLOOR PLANS OF TYPE C



BASEMENT AND FIRST FLOOR PLANS OF TYPE A



SECOND AND THIRD FLOOR PLANS OF TYPE A

0 5 10 20 30 ft.

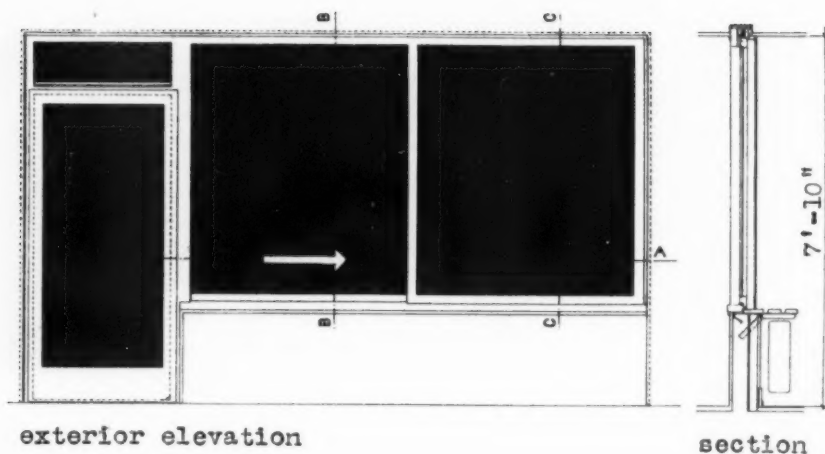


*Ad Astra*

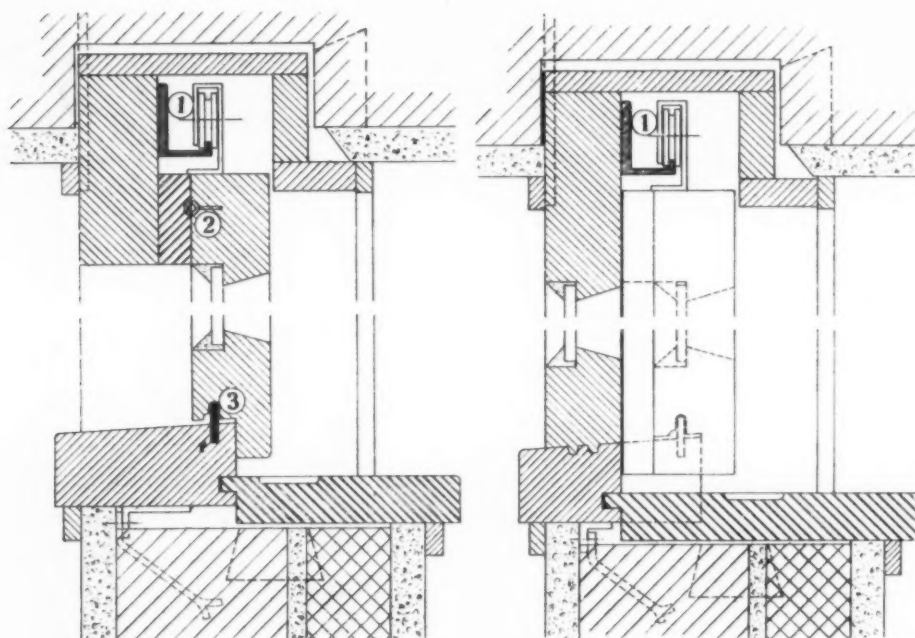
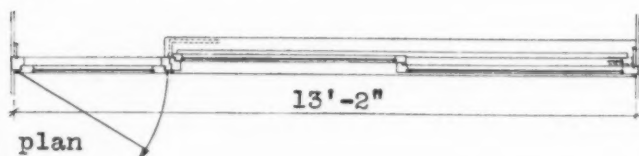
## HOUSING DEVELOPMENT, "NEUBUEHL," ZURICH

ARTARIA AND SCHMIDT, HUBACHER AND STEIGER, M. E. HAEFELI,  
W. M. MOSER, AND ROTH, ARCHITECTS

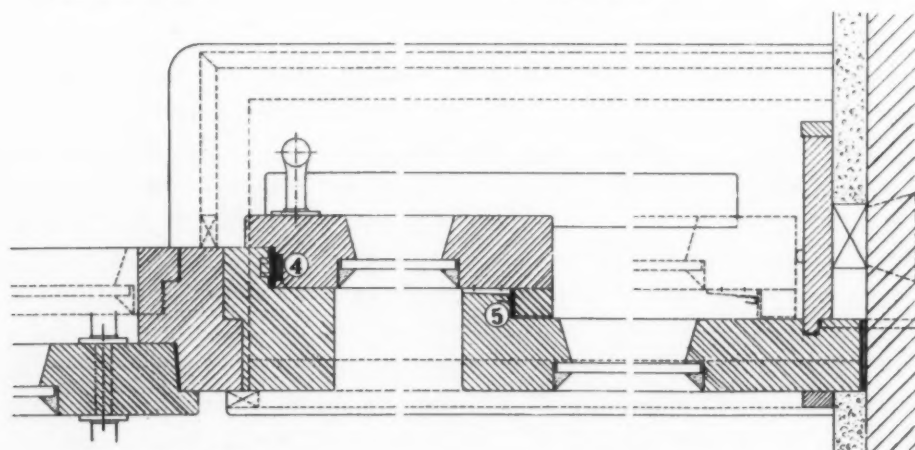
This development applied the results of a survey on required living accommodations in the erection of about 200 apartments and dwellings. It is situated on a hill slope and the houses are arranged so as to give full advantage of the views towards the lake and the city. Seven architects of the younger generation co-operated in the planning and execution of the development. The houses are intended for employees of moderate income. The only luxury permitted was the use of large plate glass windows, which slide easily in horizontal direction and give an unobstructed view and admit a maximum of light, sun and air. To eliminate supports in these window openings, the reinforced concrete floors span the entire width of the row houses, from one party wall to another. The walls themselves are built of large-size hollow tile blocks. Where the row houses are built on sloping ground their flat roofs are stepped down and used as roof terraces. All flat roofs are drained towards the inside of the houses. This prevents down-spouts from freezing. Economical requirements of modern housekeeping and living were considered for size and arrangement of rooms. There are large living rooms that open on garden terraces or balconies. There are also service rooms of minimal size and straight stairways in single runs from floor to floor. The whole development is heated by a central hot-water heating plant. The supply conduits run through the basement of the houses and are accessible for repairs. The architects also supervised the decorating and furnishing of apartments.



HORIZONTALLY SLIDING PLATE GLASS WINDOW FOR LIVING ROOMS OF "NEUBUEHL" HOUSING DEVELOPMENT. GLAZED DOOR USED AS ENTRANCE FROM TERRACE.



- 1 Track with overhead rollers.
- 2 Rubber gasket to insure watertight and airtight connection.
- 3 Guide rail at sill.



- 4 Hardware of refrigerator type used for tight fastening.
- 5 Rubber gasket with spring.

Bauwelt





VIEW OF GARDEN PORCHES ACCESSIBLE FROM LIVING ROOM

## HOUSING DEVELOPMENT, "NEUBUEHL," ZURICH

ARTARIA AND SCHMIDT, HUBACHER AND STEIGER, M. E. HAEFELI,  
W. M. MOSER, AND ROTH, ARCHITECTS



SOUTH VIEW OF  
HOUSING ROWS

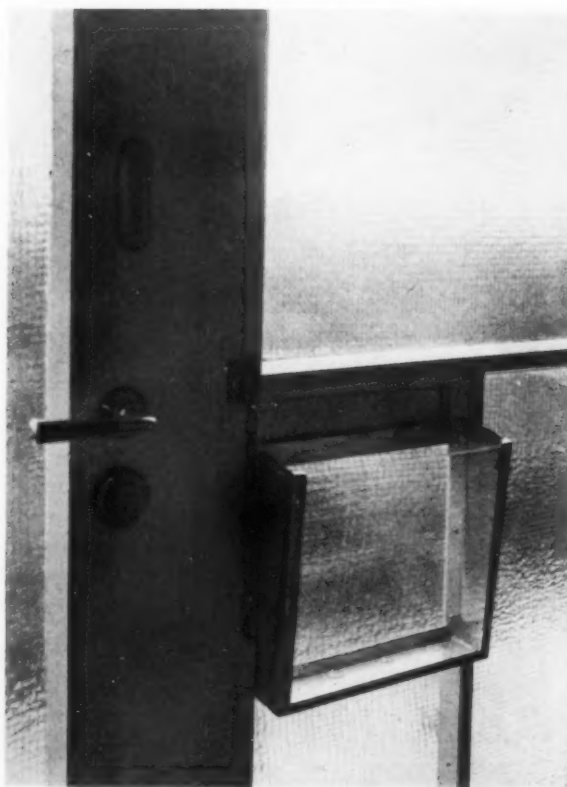


FRONT ENTRANCES

ROOF TERRACE



MAIL BOX AS PART OF ENTRANCE DOOR



HOUSING DEVELOPMENT, "NEUBUEHL," ZURICH

LIVING ROOM



LIVING-DINING ROOM





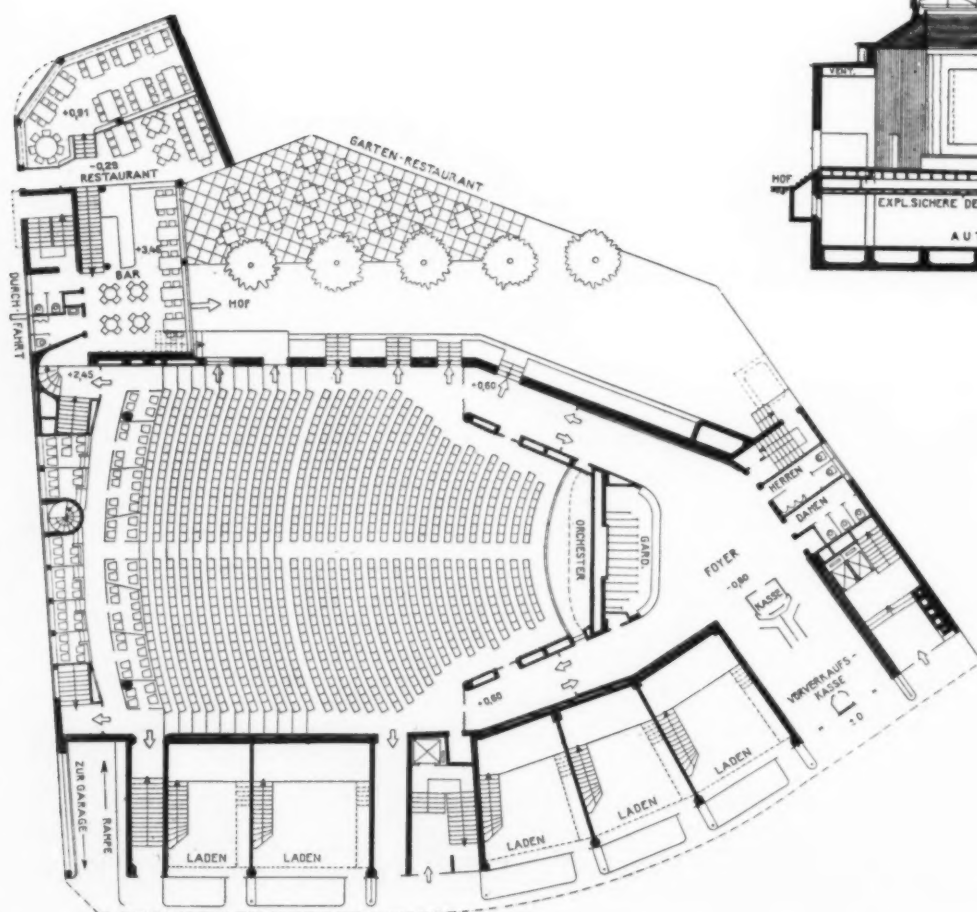
## THE Z-BUILDING, ZURICH

CONTAINING OFFICES, STORES, MOVIE THEATER, RESTAURANT, APARTMENTS, GARAGE AND SWIMMING POOL

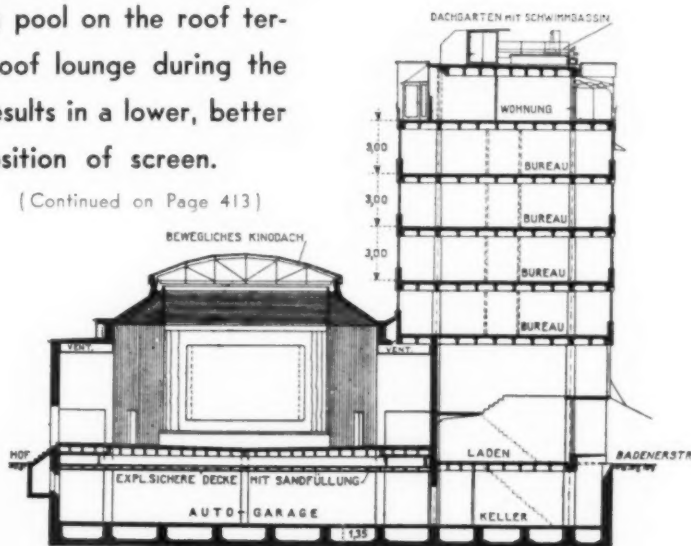
HUBACHER AND STEIGER, ARCHITECTS

The design of this building offered difficulties on account of the small and irregular shaped plot. It was necessary to obtain a good arrangement for building elements of diverse character. The supporting structure is of reinforced concrete. In the office and store building the floors are cantilevered over the columns, which permits continuous windows for display or working. This system also reduced the number of supports and made possible other economies through the balancing of the floor loads. The apartments at roof level are accessible from an open, but covered passage. This open gallery facilitates cross ventilation of the apartments. They are provided with balconies. Tenants of apartments are permitted use of a swimming pool on the roof terrace. The office employees make use of an open-air roof lounge during the lunch hours. The movie theater has no balcony. This results in a lower, better proportioned room, good acoustics and favorable position of screen.

(Continued on Page 413)



Schweiz, Bauzeitung

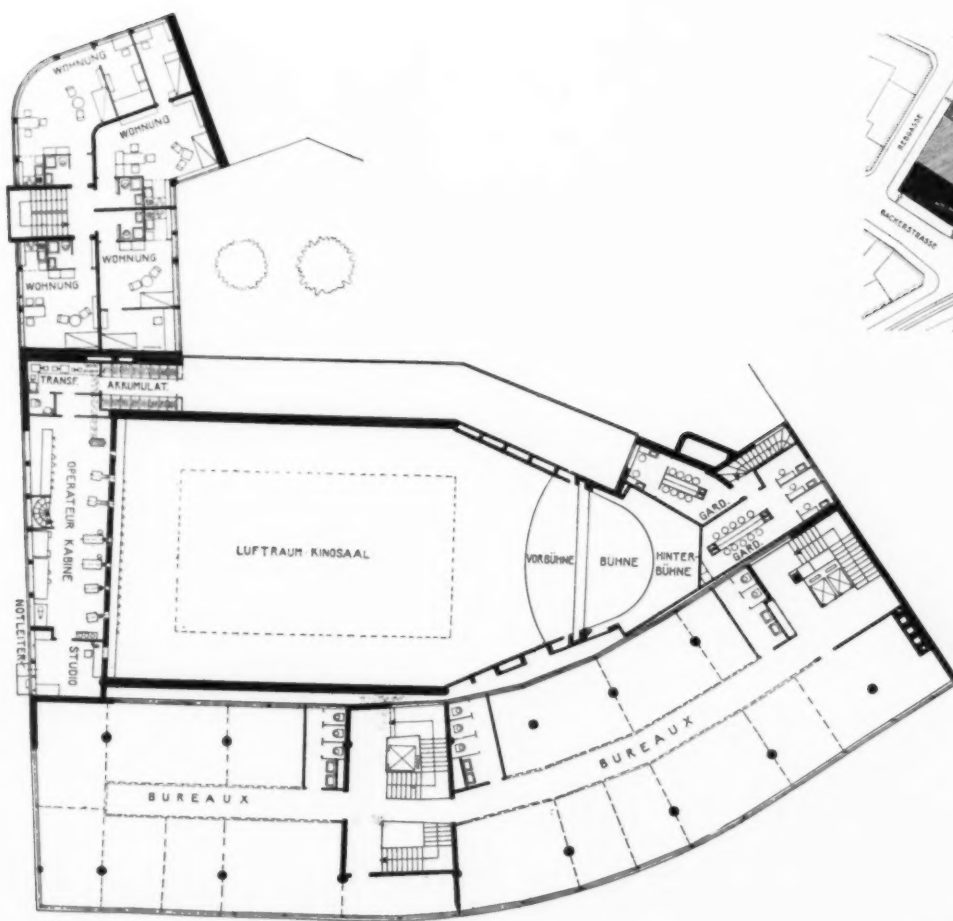


SECTION

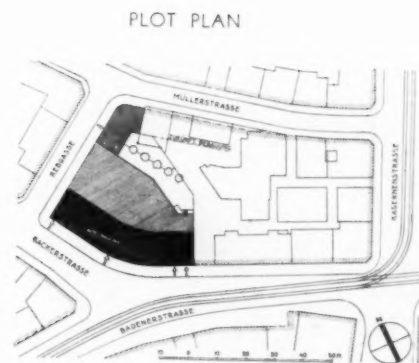
GROUND FLOOR PLAN



EXTERIOR VIEW



Schweiz, Bauzeitung

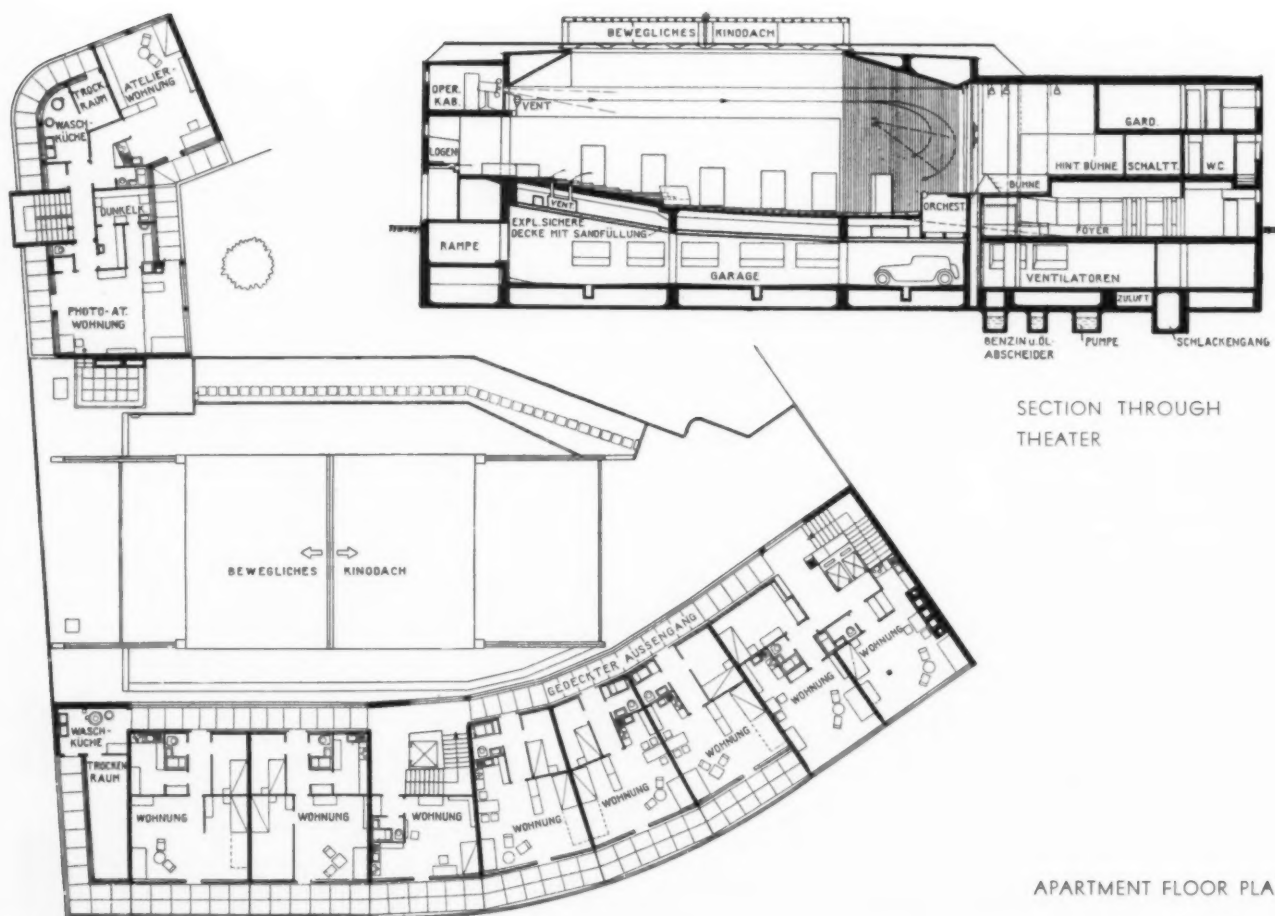


PLOT PLAN

PLAN AT OFFICE FLOOR LEVEL



THE ROOF OVER THEATER IS MOVABLE AND TWO PARTS OF THIS ROOF CAN SLIDE BACK SO AS TO OPEN THE THEATER TO THE SKY.

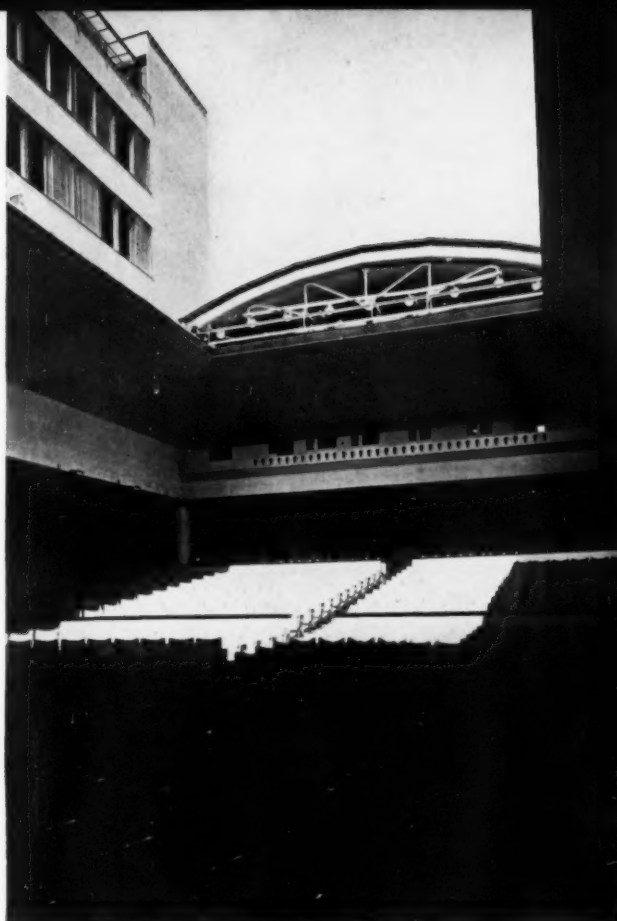


SECTION THROUGH THEATER

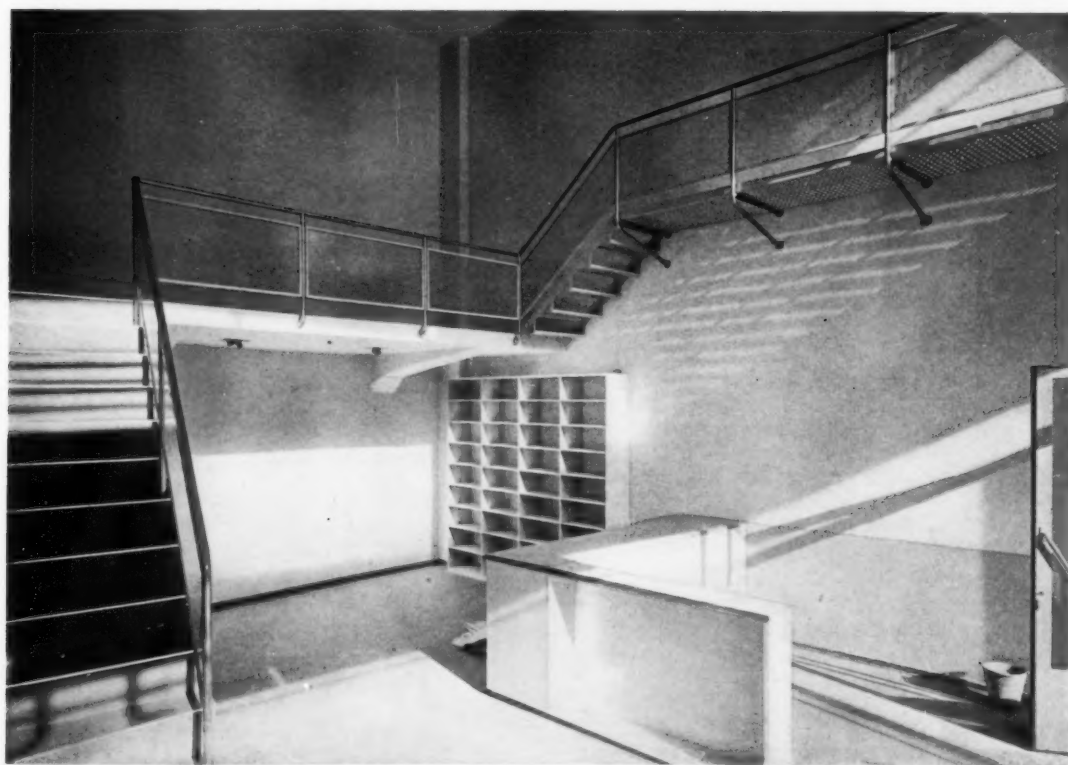
APARTMENT FLOOR PLAN

Schweiz, Bauzeitung





Ceilings are surfaced with Celotex acoustical tile. The roof over theater is movable and two parts of this roof can slide back so as to open the theater to the sky. This feature supplements the air conditioning when complete change of air is desired. The restaurant is built over a limited area and to gain space it has three successive levels. The highest part is directly connected with the theater. The restaurant



INTERIOR OF TYPICAL STORE



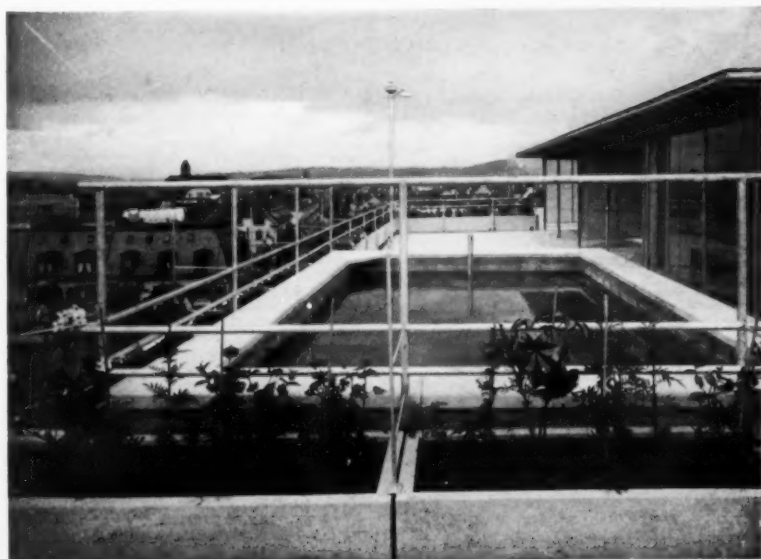
LEFT: Z-BUILDING, ZURICH, SHOWING THE RESTAURANT. BELOW: INTERIOR VIEW OF APARTMENT, SITUATED AT ROOF LEVEL. ENTRANCE TO THESE APARTMENTS IS BY AN OPEN GALLERY.

is supplied by a completely electrified kitchen. The garage is situated under the theater with an explosion-proof ceiling. Windows are horizontally sliding and of steel. Exterior walls are covered with synthetic stone slabs. Built-up roofing is graveled,





RIGHT: RESTAURANT INTERIOR WITH DINING TERRACE OUTSIDE.  
BELOW: A SWIMMING POOL FOR EMPLOYEES IS SITUATED ON THE ROOF.



and protected by concrete tiles on terraces. Bright colored awnings built in the window lintels provide the large glass areas with shade in summer and add a cheerful note to the simplified architecture.



# HOUSE NEAR ZURICH

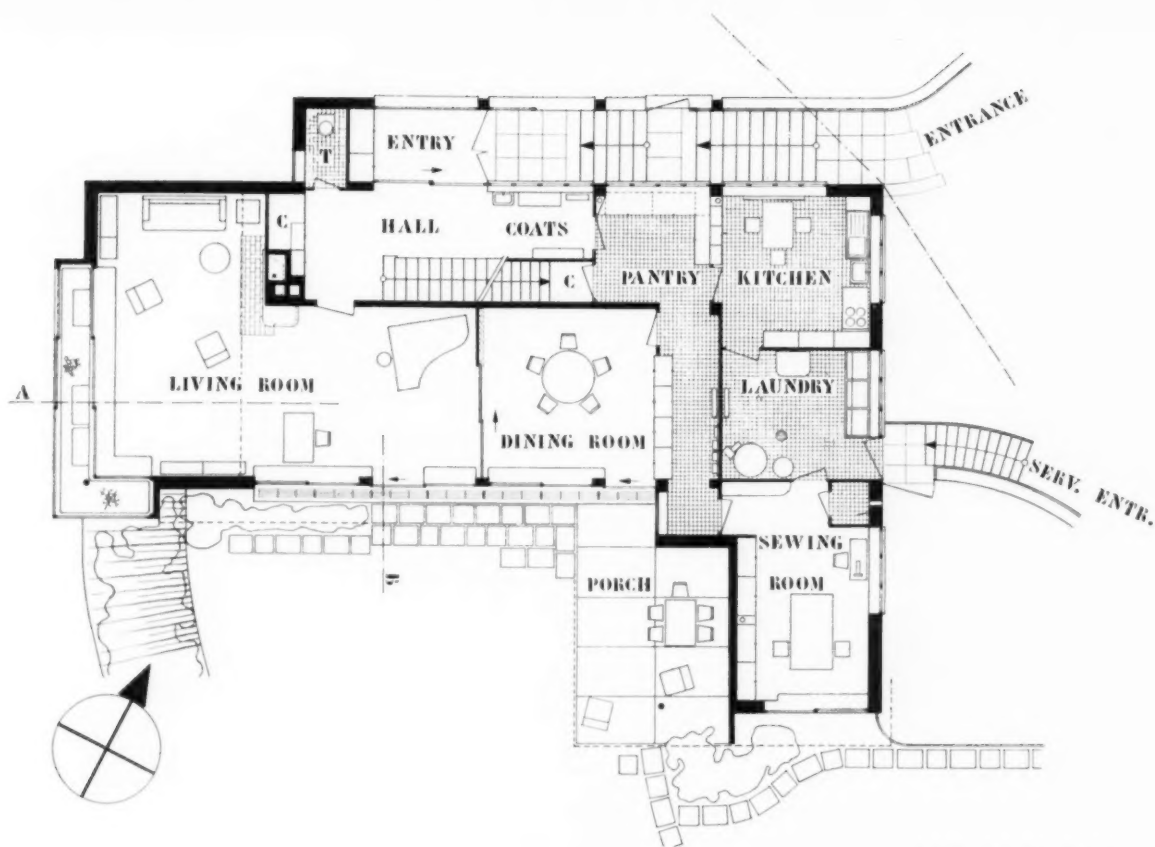
M. E. HAEFELI, ARCHITECT

This house intended for a family with children is situated on a hillside overlooking the Lake of Zurich. Views from the living room and good exposure of the bedrooms were regarded essential in the plan layout. Large terraces for living and sleeping are accessible from all rooms, and connect the house with the natural surroundings. Horizontally sliding plate glass windows favor a perfect view of the outside and admit adequate air, light and sun. The large corner window of the living room commands a sweeping view. This window is formed of two sheets of glass a few feet apart to serve the double purpose of a conservatory and for better insulation. Accommodations and requirements for the favorable

VIEW FROM SOUTH

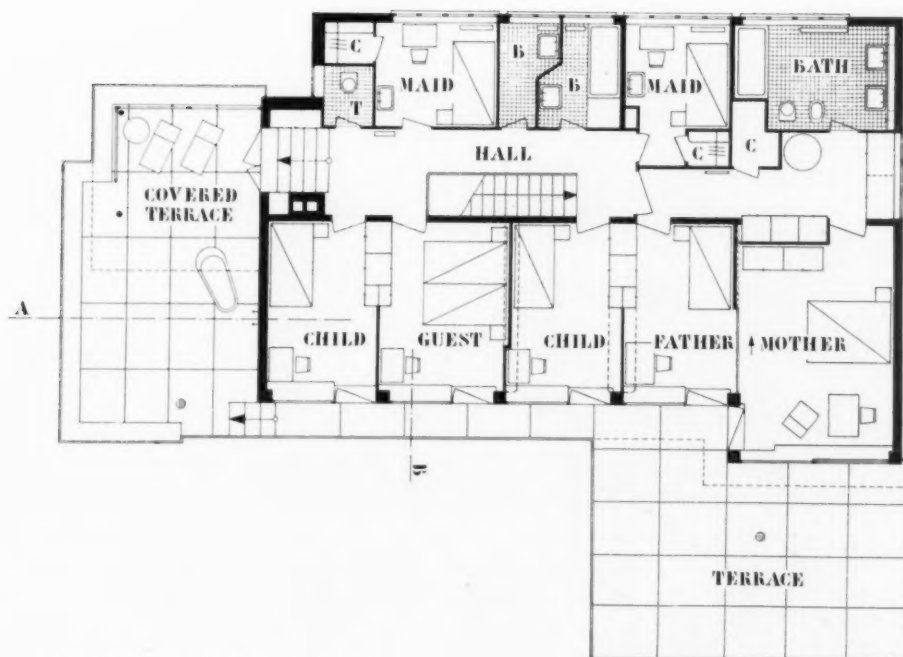


*Finsler*



FIRST FLOOR PLAN

development of children have been considered in the provision of indoor and outdoor play spaces, safe balcony guards and so on. The house is completely fireproof, being built of reinforced concrete, steel and hollow tile blocks, stuccoed on the outside and plastered inside. Light buff, blue and green were chosen as colors known to be cheerful and restful to the eye. Interior walls have washable surfaces.



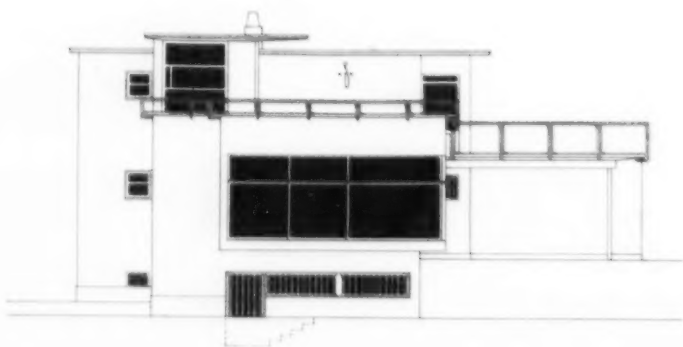
SECOND FLOOR PLAN



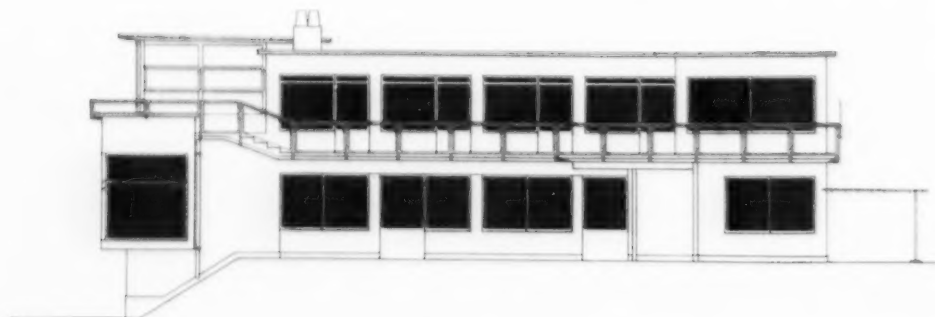
THE ENTRANCES ARE AT NORTHEAST SIDE OF HOUSE. THE MAIN ENTRY IS THROUGH GARDEN AND THERE IS DIRECT ACCESS FROM GARAGE, UNDER HOUSE, TO ENTRANCE STAIRWAY SHOWN AT RIGHT.



NORTHEAST ELEVATION



SOUTHWEST ELEVATION



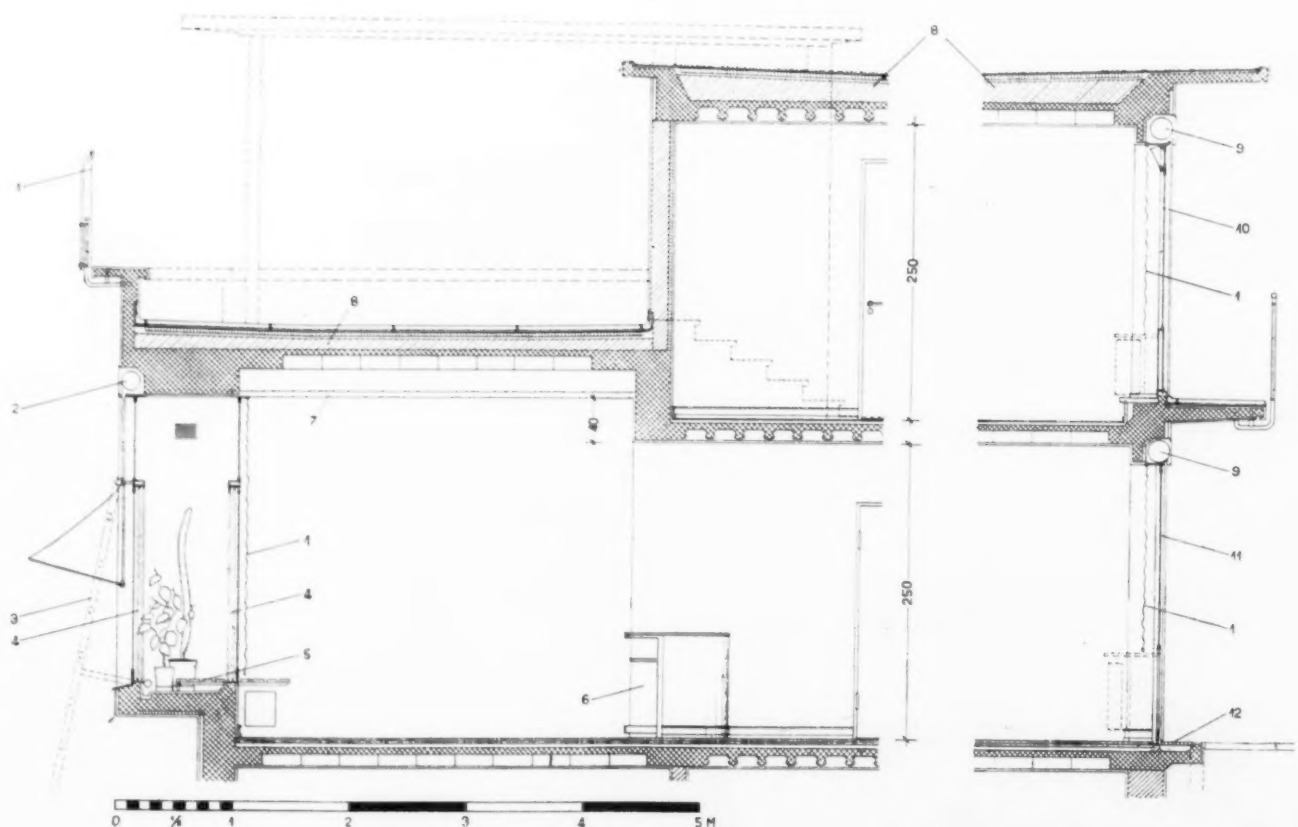
SOUTHEAST ELEVATION





*Finsler Photos*

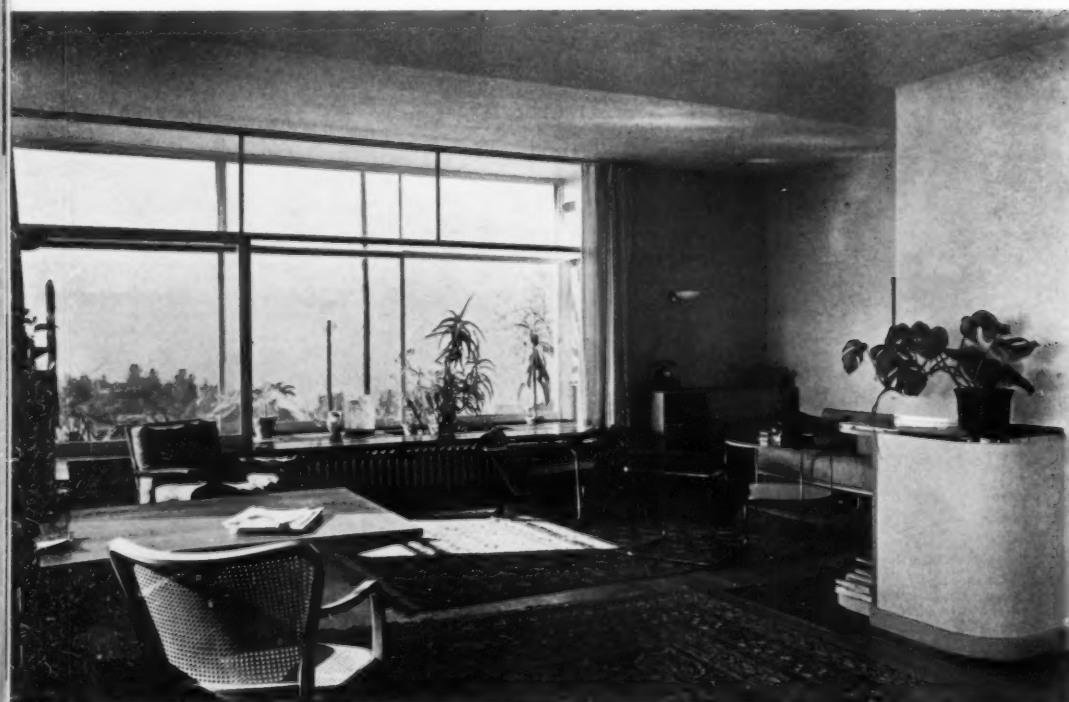
GARDEN VIEW OF HOUSE FACING SOUTH AND EAST. AWNINGS TO SHELTER WINDOWS ARE INCORPORATED IN CONSTRUCTION OF WALLS. WINDOWS SLIDE HORIZONTALLY. SECTION BELOW SHOWS A DOUBLE GLASS WALL FOR CONSERVATORY. CONSTRUCTION IS FIREPROOF THROUGHOUT.





Finsler Photos

EXTERIOR GALLERY TO COVERED TERRACE FROM MASTER BEDROOM SUITE.

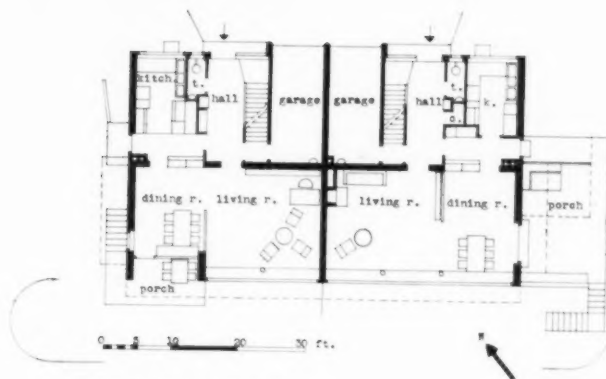
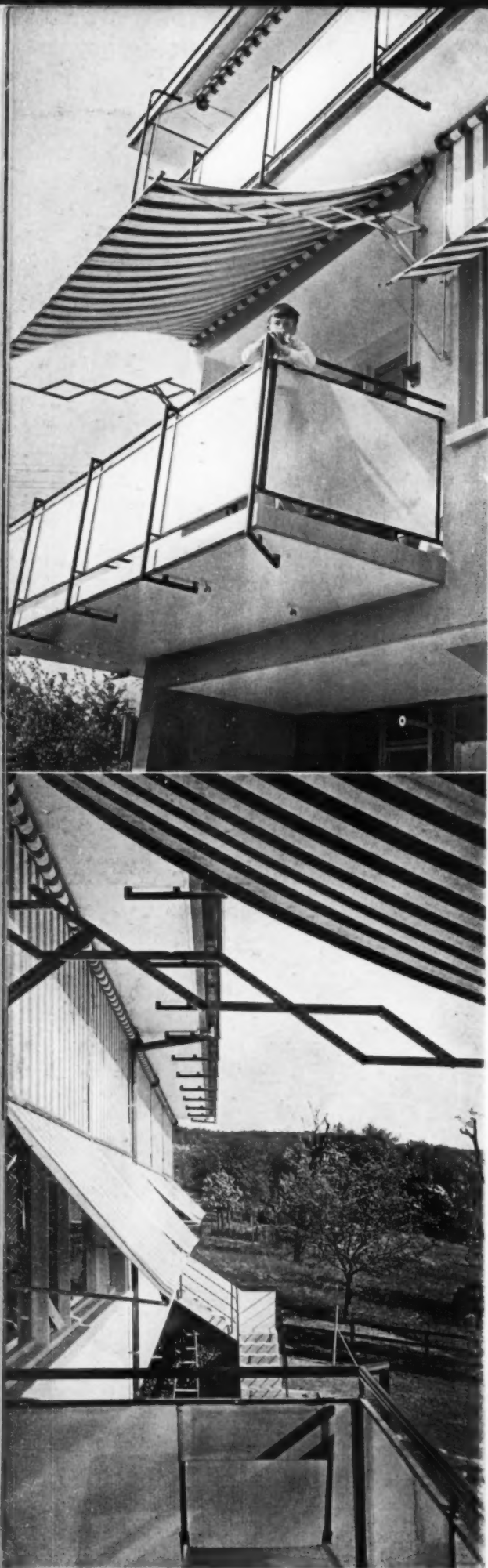


LIVING ROOM



LIVING ROOM INTERIOR TOWARD GARDEN AND LIVING TERRACE.





FIRST FLOOR PLAN

AT LEFT, BALCONY VIEWS

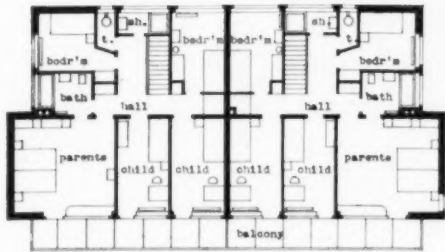
## DOUBLE HOUSE NEAR ZURICH, SWITZERLAND

WERNER M. MOSER, ARCHITECT

A two-family house situated on a southwest slope overlooking a valley, lake and the city of Zurich. The large windows and balconies of the more important rooms face the view. Entrances are to the rear or street side. The dining and living rooms can be combined so as to serve as a single room. The architect conceived the house as a place that would be attractive to children. This was attained by provision of space for children to play and to store their playthings, and by the lightness of forms and the pleasant lemon-yellow color of the wall surfaces. The mechanical details of construction have been worked out with the utmost exactness.

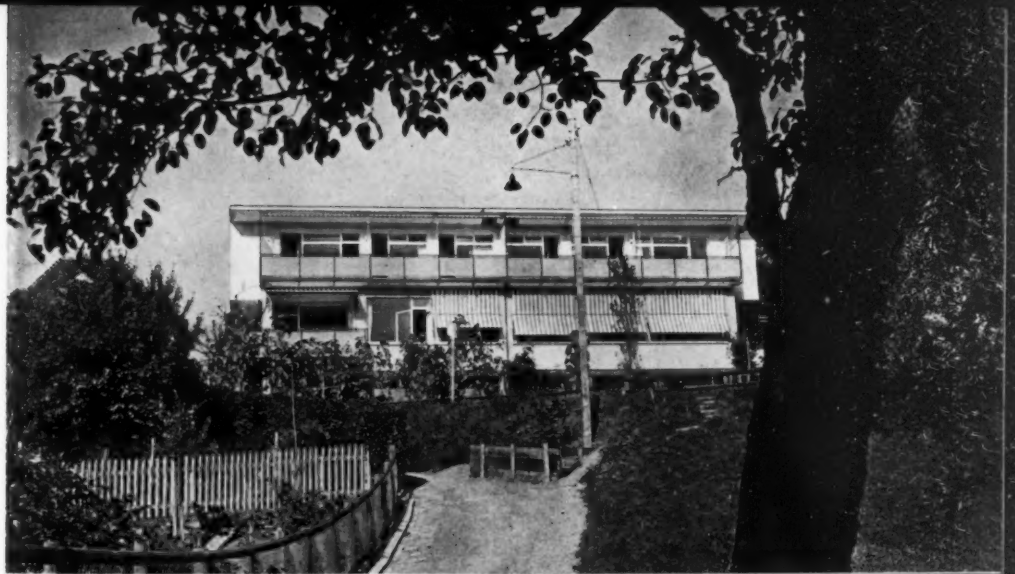


LIVING ROOM



SECOND FLOOR PLAN

VIEW OF HOUSE FROM GARDEN

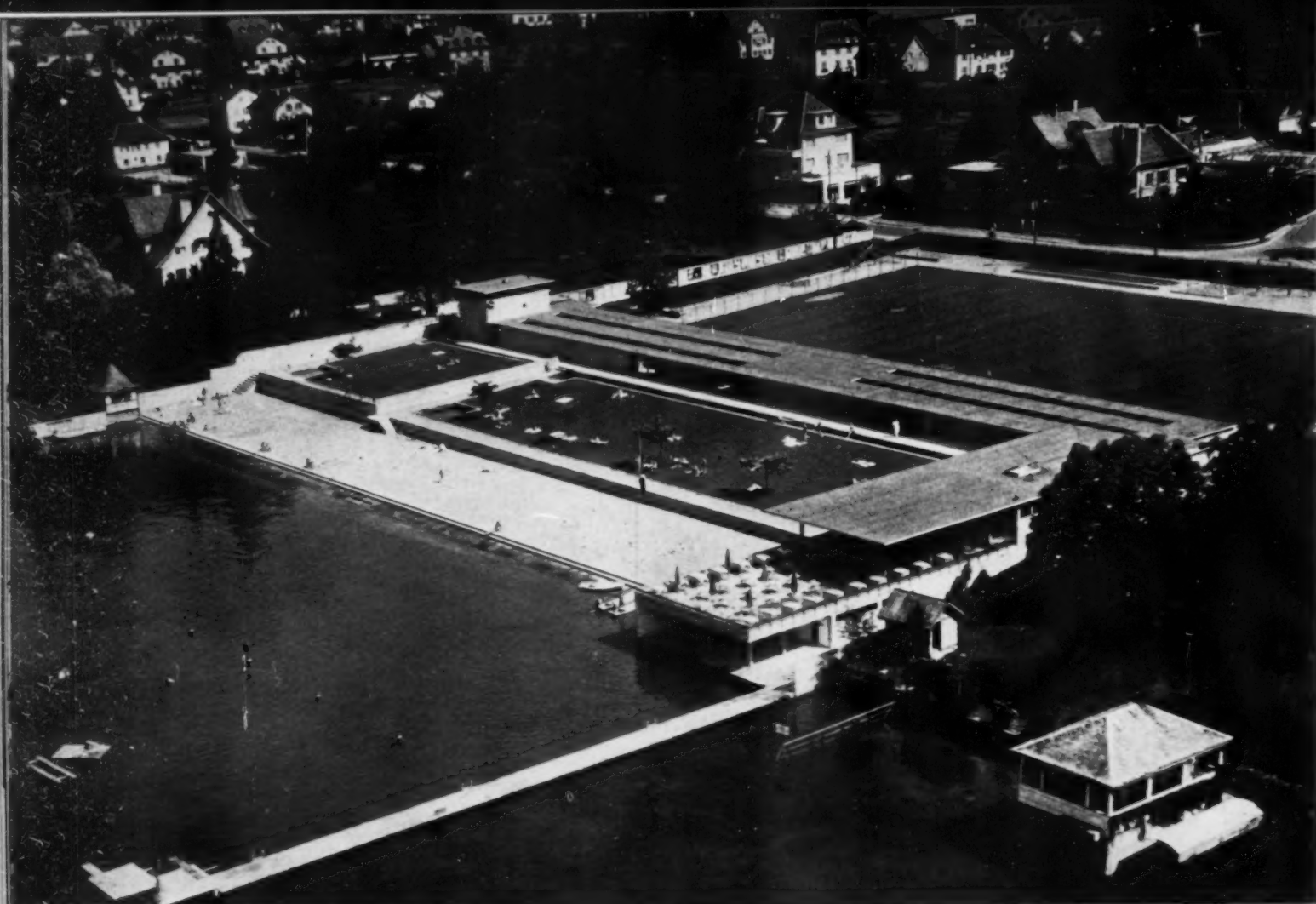


LIVING ROOM INTERIOR FROM DINING ROOM



ANGLE OF LIVING ROOM





Astra

## BATHING ESTABLISHMENT ON LAKE OF ZURICH

STEGER AND EGENDER, ARCHITECTS



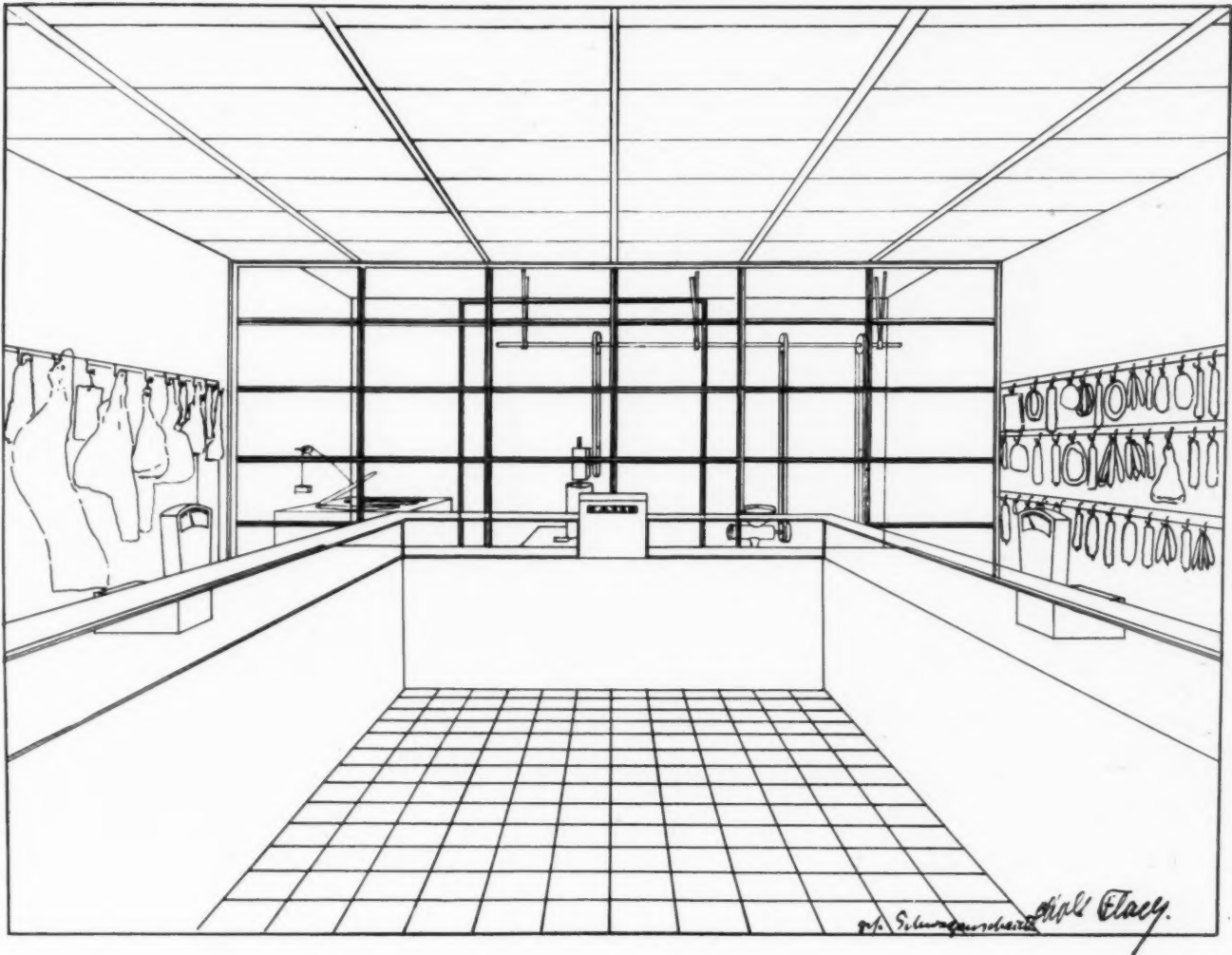
VIEW OF END PAVILION, SHOWING  
DINING TERRACE ABOVE AND DRESS-  
ING ROOMS BELOW.

THE CONSTRUCTION OF PAVILIONS AND BATHHOUSES IS OF  
CONCRETE AND FIREPROOF.



SHELTER AT LOWER LEVEL, USED AS  
PASSAGE TO DRESSING ROOMS.





BUTCHER SHOP INTERIOR

A suggested scheme for the treatment of a butcher shop interior with use of sanitary material such as enameled steel or glass. The workroom at the far end of the shop is visible through a glazed partition between store and workroom.



EXTERIOR STAIRWAY  
FROM  
GARDEN TO TERRACE

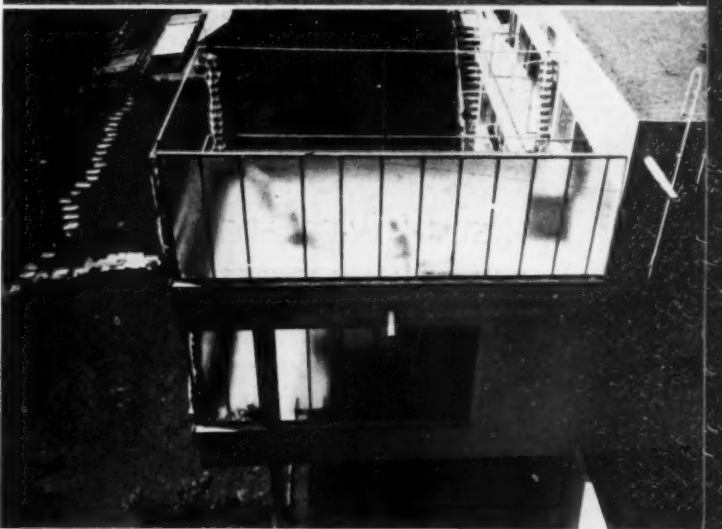
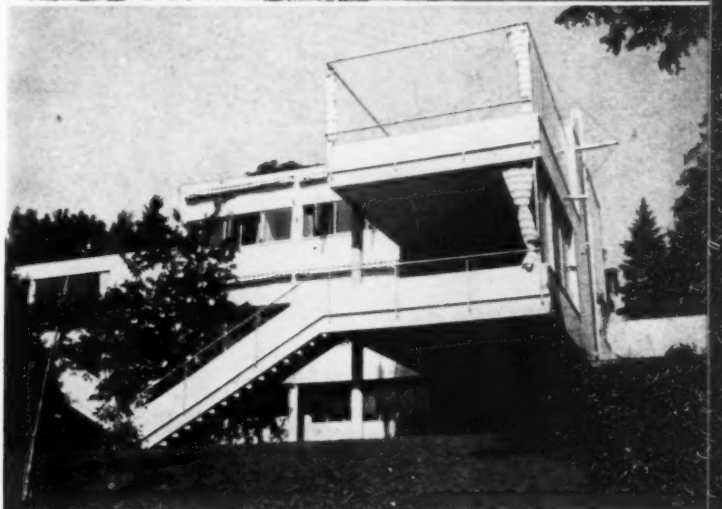
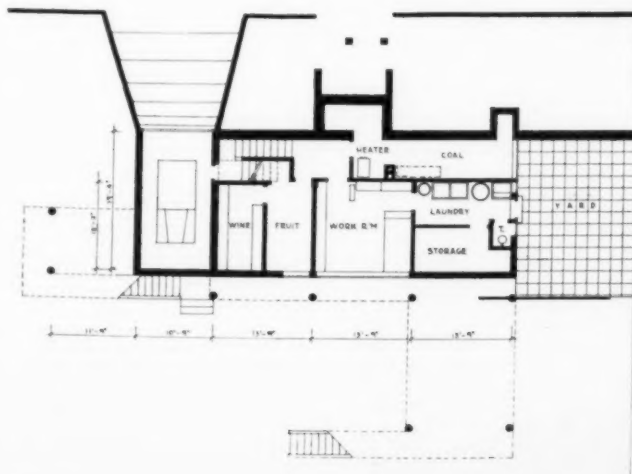
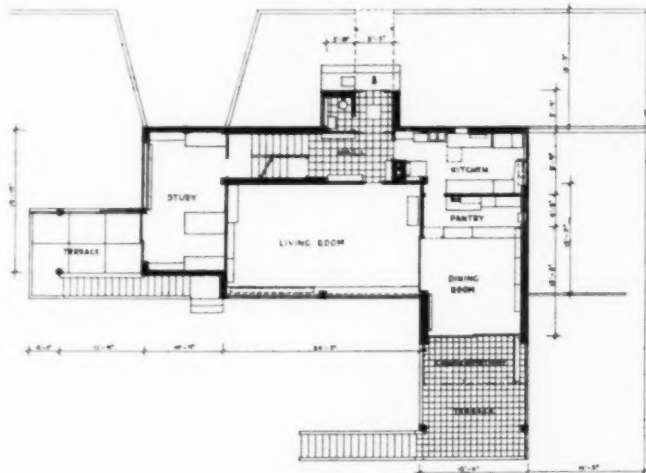
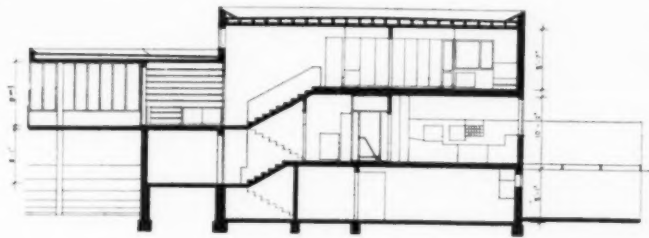
## HOUSE IN WIESBADEN

MARCEL BREUER, ARCHITECT

The plot is situated on a southerly slope with street at far side higher in level. All windows and terraces face to south and west in order to gain advantage of sun and view of garden and Rhine valley. Terraces are supported on concrete columns so that garden area continues under the house.

**CONSTRUCTION** with steel frame of standard sections; exterior walls of aerated concrete blocks 5 inches thick, backed with shredded wood and magnesite composition board. A two-inch air space separates the two wall elements; floors are concrete slabs and steel beams; the face of house is light gray stucco, interior walls and partitions are plastered. Floors are linoleum and carpet inside, tile for terraces. Cost of house, less than \$10,000.

BELOW ARE SHOWN SECTION AND PLANS.  
AT RIGHT SOUTH ELEVATION, SOUTH TER-  
RACES, AND GARDEN SHELTER.





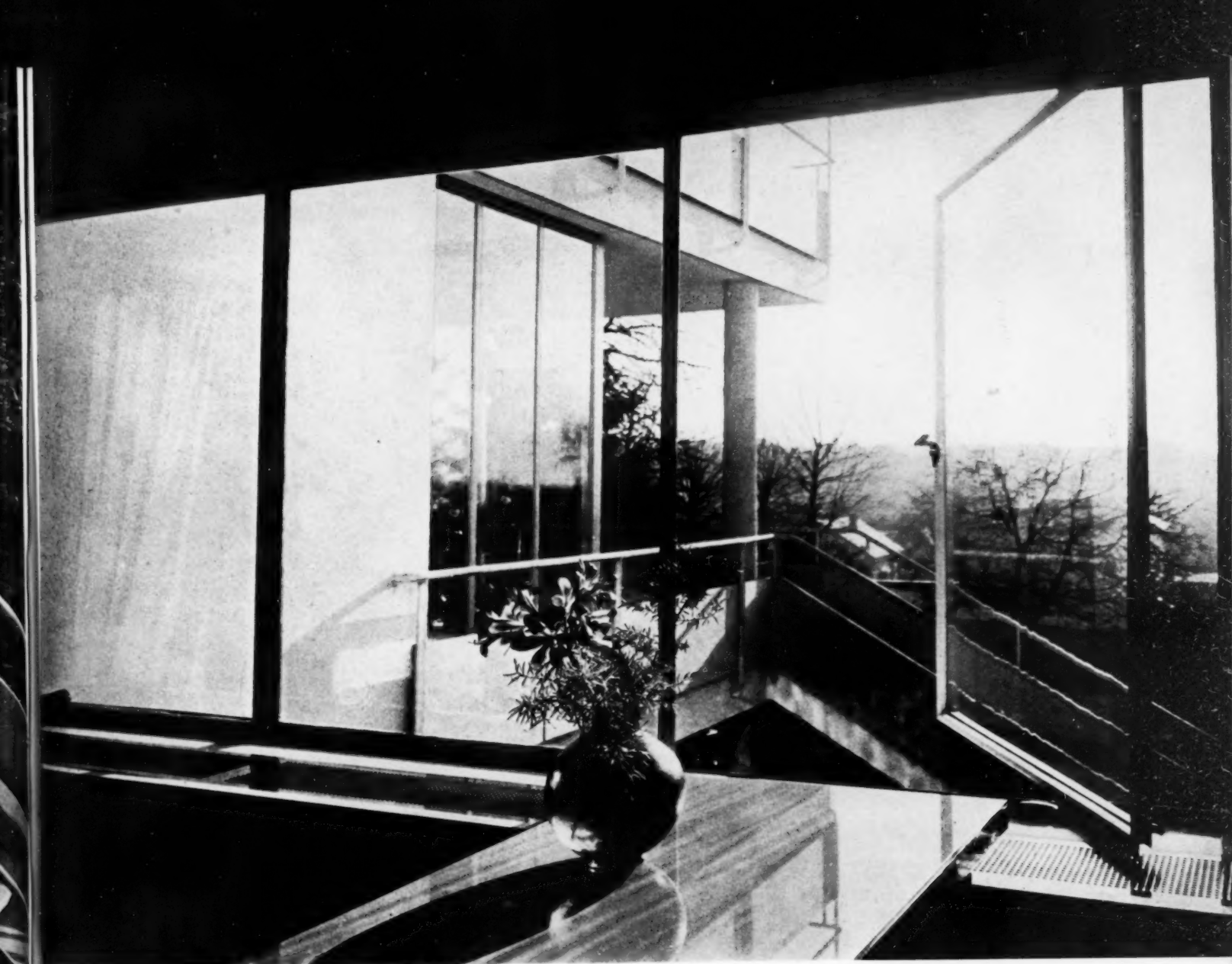


SOUTH TERRACE

HOUSE IN WIESBADEN, GERMANY  
MARCEL BREUER, ARCHITECT



LIVING ROOM



VIEW FROM LIVING ROOM TO SOUTH TERRACE.

STUDY AND WORKROOM



PATHOLOGICAL INSTITUTE, MILAN, ITALY

ENRICO A. GRIFFINI,  
ARCHITECT



THE SOLARIUM

LECTURE ROOM





ITALY

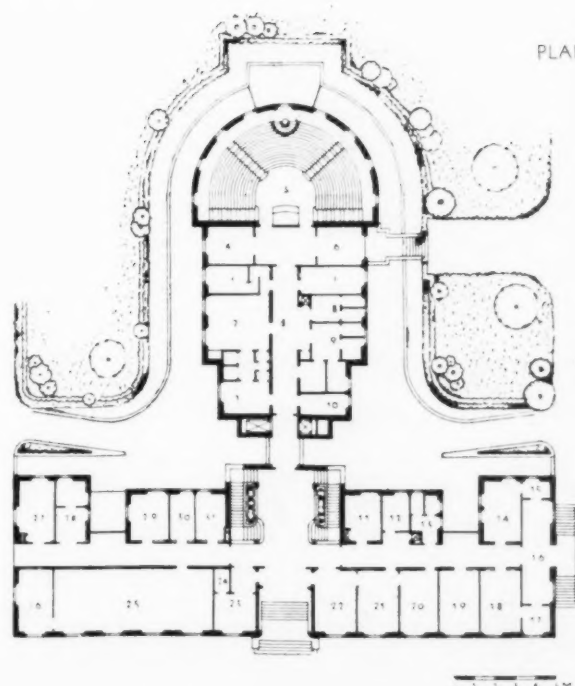
PLAN

PLAN: (1) Radio therapy; (2) radio diagnosis; (3) dark room; (4) service; (5) lecture hall; (6) vestibule; (7) office of Director; (8) toilets; (9) electro-therapy; (10) waiting room; (11) registry; (12) archives; (13) toilets; (14) antechamber; (15) dressing room; (16) vestibule; (17) dressing room; (18) antechamber; (19) analysis; (20) visit control; (21) study; (22) waiting room.

SIDE VIEW: Low element is lecture room; next, the laboratories. The stair inclosure and the large mass is the ward section, crowned by the solarium. The large central window in the ward building lights the corridors.

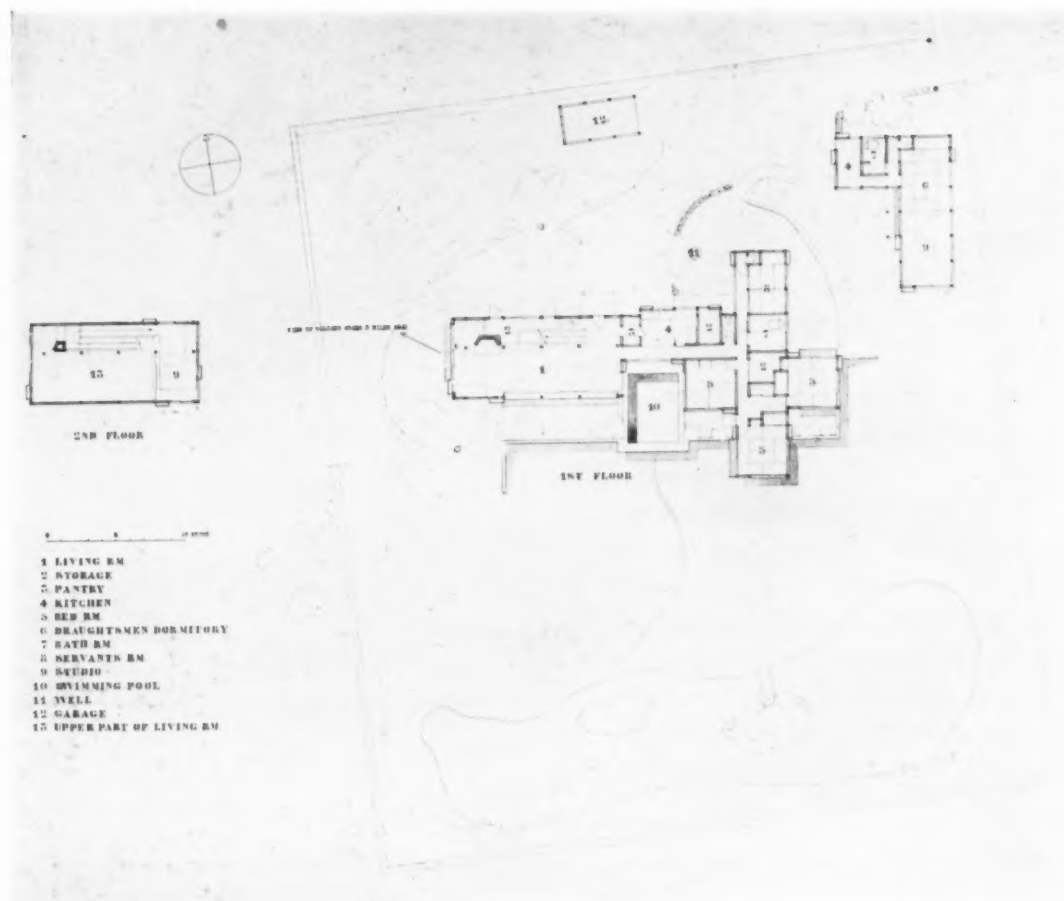
THE SOLARIUM: The ceiling is rose colored; walls, light orange-vermilion; column and ironwork are in vivid reddish purple. Cots are vivid red; hangings are black and red bands of different shades; floor is of dull red tile.

LECTURE ROOM: Walls in light gray, border lines of silver; floor of bright blue linoleum in the seating space; risers and baseboard of black linoleum; floor of lecture platform of black linoleum; stair nosing is aluminum. The window shades to darken room for slides and moving pictures are electrically controlled from the lecture table.

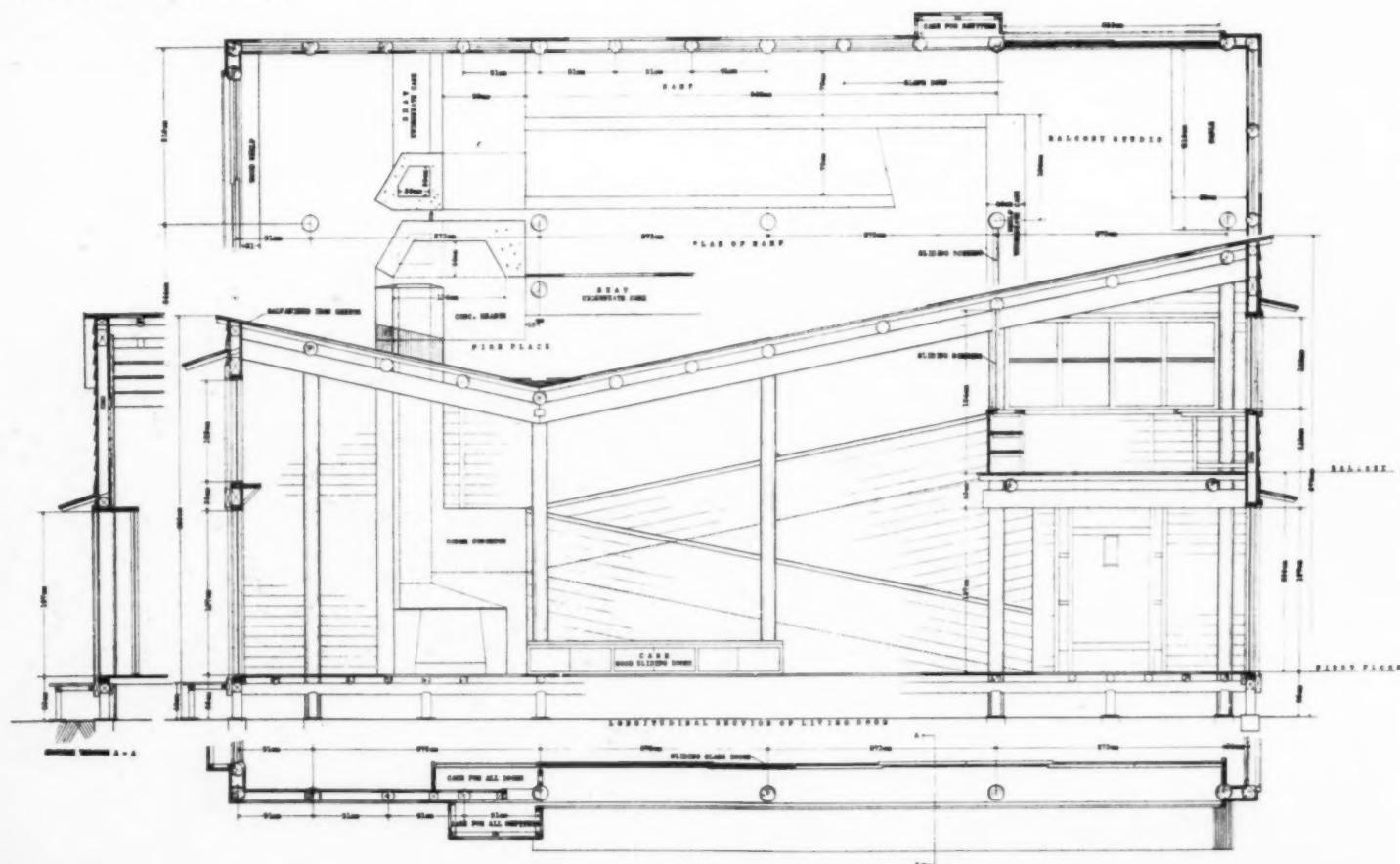


EXTERIOR WITH LECTURE ROOM, STAIR INCLOSURE AND MAIN BLOCK.





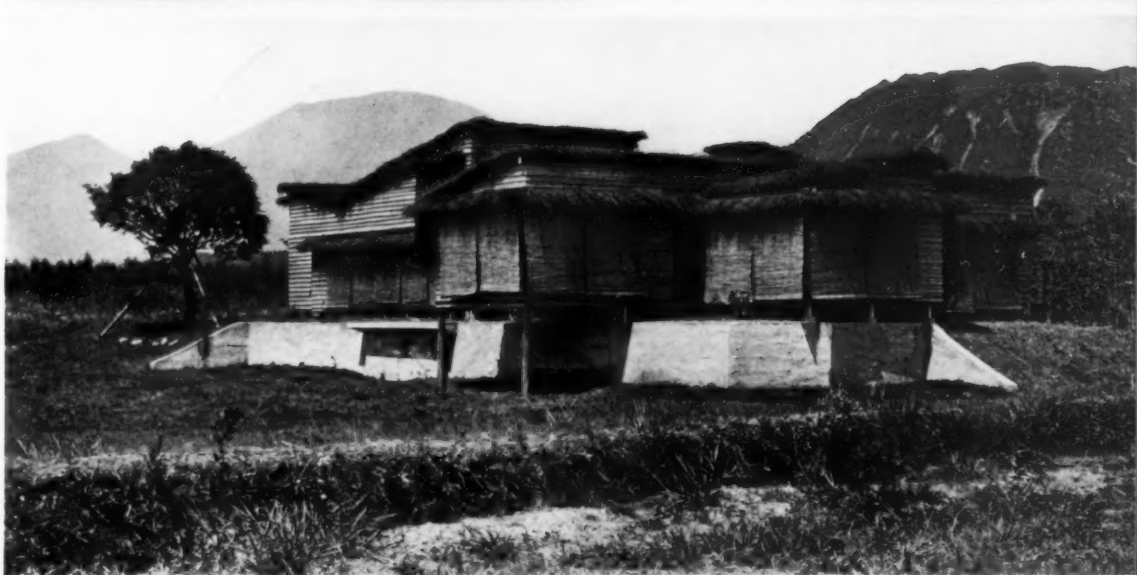
THE HOUSE IS ON A PLATEAU ENTIRELY SURROUNDED BY MOUNTAINS. THE JAPANESE EIGHT-MAT ROOMS ACCOMMODATE FROM THREE TO SIX SLEEPERS.



VIEW TO SOUTH



SOUTH AND EAST  
REED SCREENS DOWN. VOL-  
CANO ASAMA IN BACK-  
GROUND.



NORTH AND WEST



**Materials:** LAVA CONCRETE, CEDAR SIDING, LARCH THATCH, CHESTNUT COLUMNS—ALL NATURAL COLOR OUTSIDE AND IN—REED SCREENS, YELLOWISH; CEDAR, ROSE; LARCH, PURPLISH; CHESTNUT, GRAY.





OVERFLOW CASCADE FROM  
PLUNGE.

# ARCHITECT'S SUMMER QUARTERS KARUIZAWA, JAPAN—1933

ANTONIN RAYMOND, ARCHITECT

## OPPOSITE PAGE:

VIEW OF LIVING ROOM ACROSS SWIMMING POOL FROM JAPANESE BEDROOM. FURNITURE WAS MADE BY CARPENTERS ON JOB, USING CEDAR, HINOK AND STRAW. LIVING ROOM: GLASS DOORS SLIDE Laterally. RAMP TO UPPER LEVEL WAS INSPIRED BY A PLAN OF LE CORBUSIER FOR A HOUSE IN SOUTH AMERICA.



JAPANESE ROOMS.





ARCHITECT'S SUMMER QUARTERS  
KARUIZAWA, JAPAN—1933

ANTONIN RAYMOND, ARCHITECT

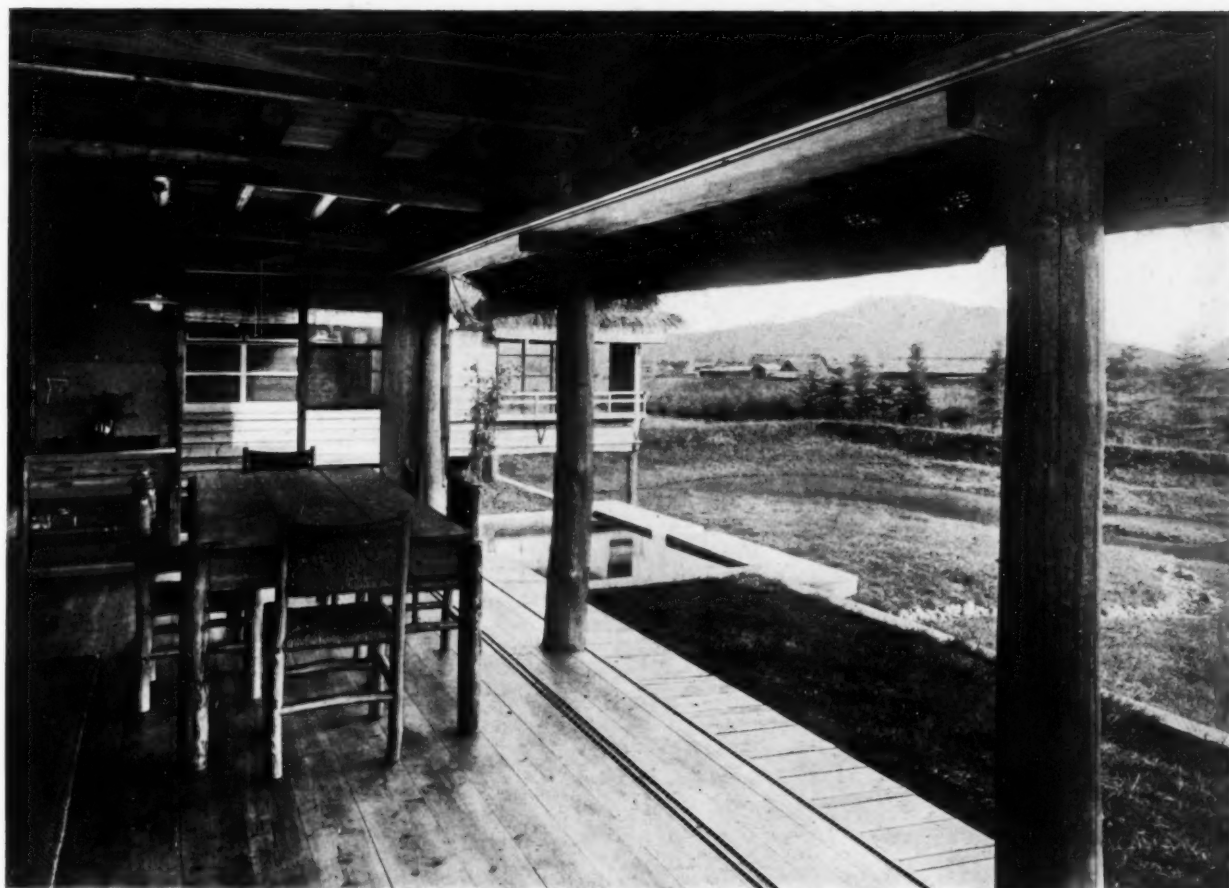
LEFT:  
RAMP AND DRAFTING ROOM

BELOW:  
TWO VIEWS OF LIVING-DIN-  
ING ROOM



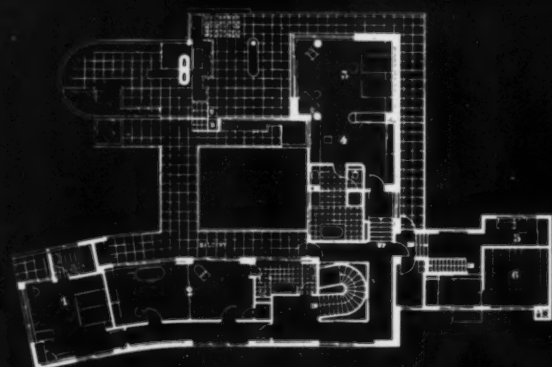


VIEWS OF JAPANESE AND FOREIGN BEDROOM AND FROM LIVING ROOM OVER SWIMMING-POOL.



RESIDENCE OF MORI-  
NOSUKE KAWASAKI,  
TOKYO, JAPAN-1933

ANTONIN RAYMOND,  
ARCHITECT



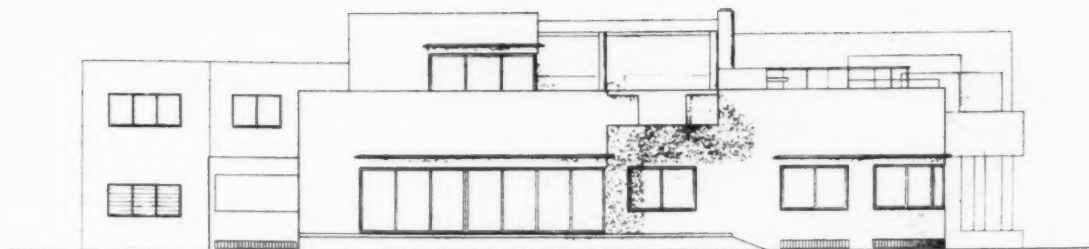
FIRST FLOOR PLAN

THIS PLAN WAS DESIGNED WITH  
A VIEW TO MAXIMUM AIR AND  
LIGHT.

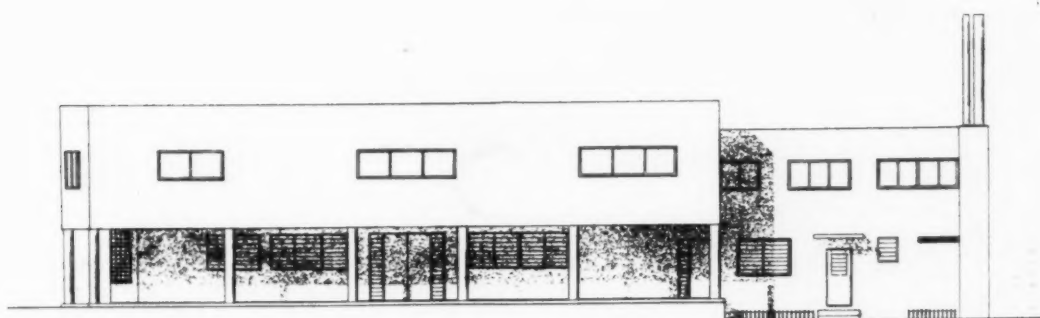
- |                     |                    |
|---------------------|--------------------|
| 1 Vestibule         | 12 Laundry         |
| 2 Hall              | 13 Japanese House  |
| 3 Reception Room    | 14 Kura            |
| 4 Study             | 15 Gardener        |
| 5 Living Room       | 16 Garage          |
| 6 Dining Room       | 17 Storage         |
| 7 Kitchen           | 18 Chauffeur       |
| 8 Family Vestibule  | 19 Cook            |
| 9 Boy's Room        | 20 Pool            |
| 10 Service Entrance | 21 Patio           |
| 11 Maid's Room      | 22 Kennel          |
|                     | 25 Japanese Garden |

ABOVE: SECOND FLOOR PLAN

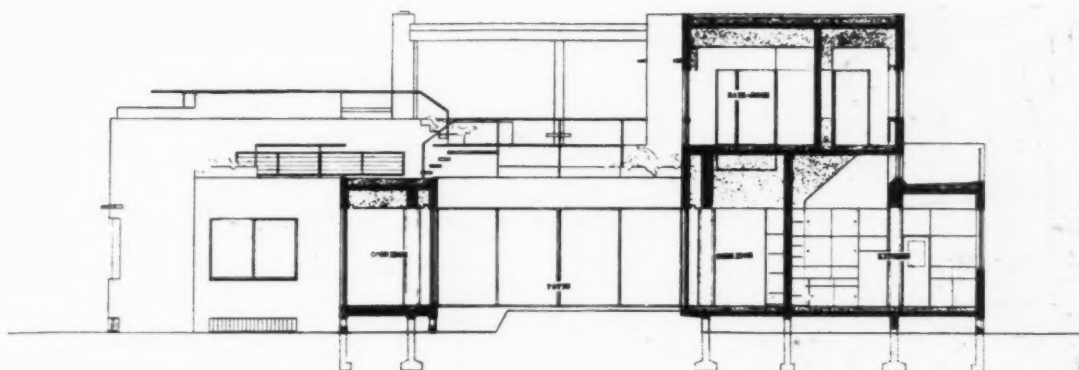
- |                   |                  |
|-------------------|------------------|
| 1 Guest's Room    | 4 Dressing Room  |
| 2 Children's Room | 5 Service Pantry |
| 3 Bedroom         | 6 Nando          |



SOUTH SIDE ELEVATION

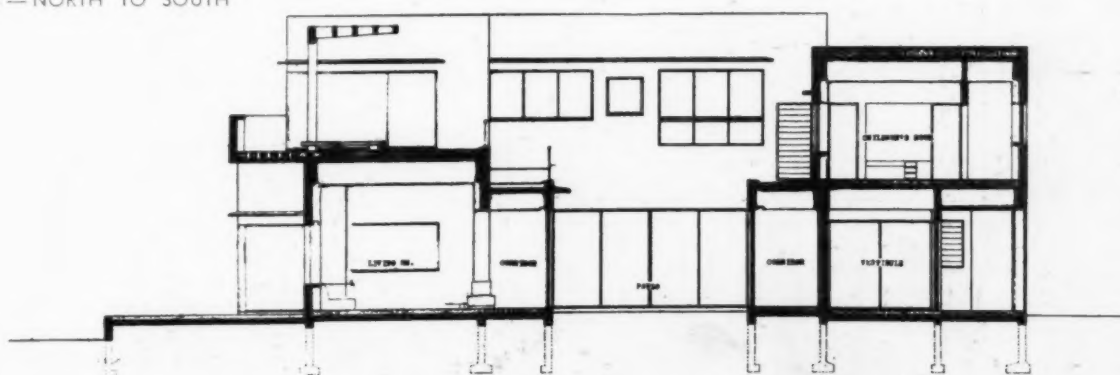


NORTH SIDE ELEVATION



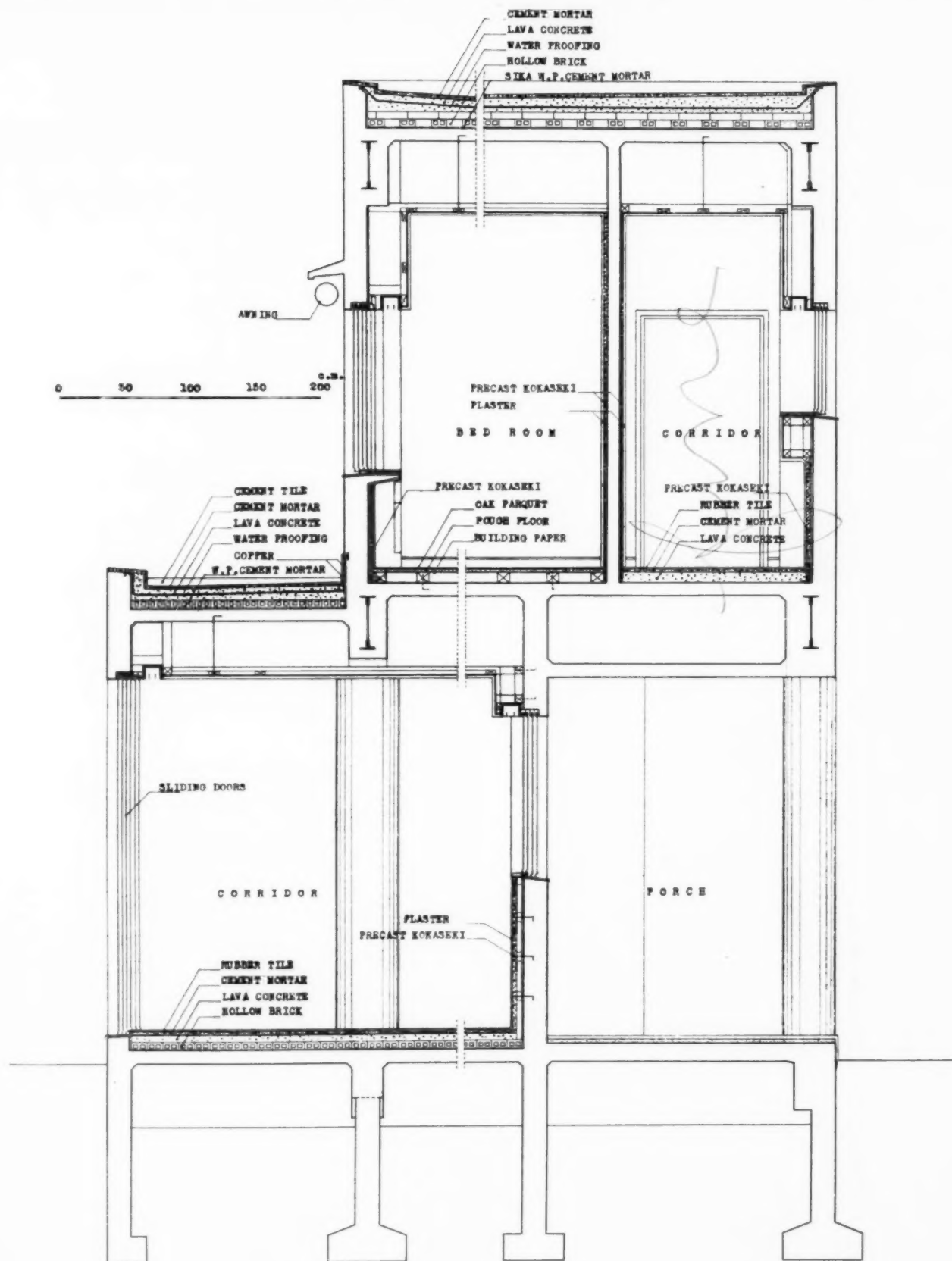
SECTION — EAST TO WEST

SECTION — NORTH TO SOUTH









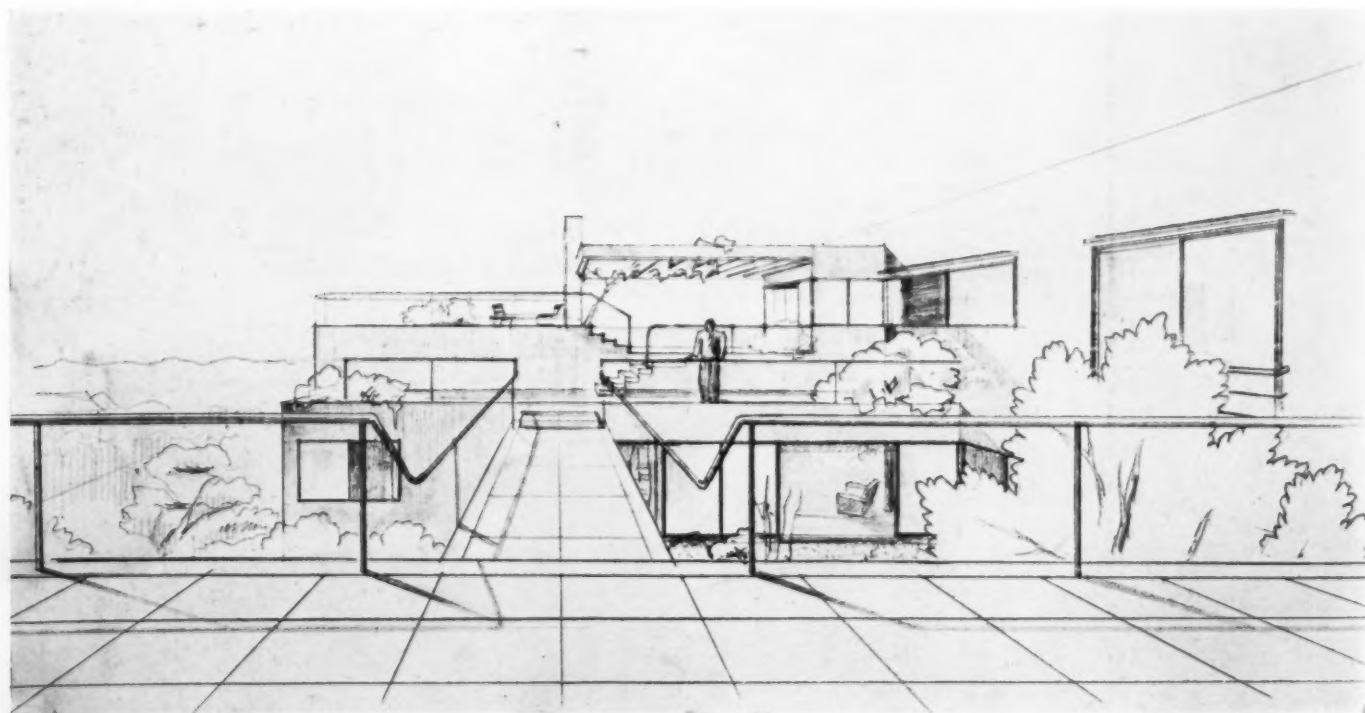
TYPICAL SECTION, SHOWING CONSTRUCTION

RESIDENCE OF MORINOSUKE KAWASAKI, TOKIO, JAPAN—1933  
ANTONIN RAYMOND, ARCHITECT



NORTH SIDE — ENTRANCE

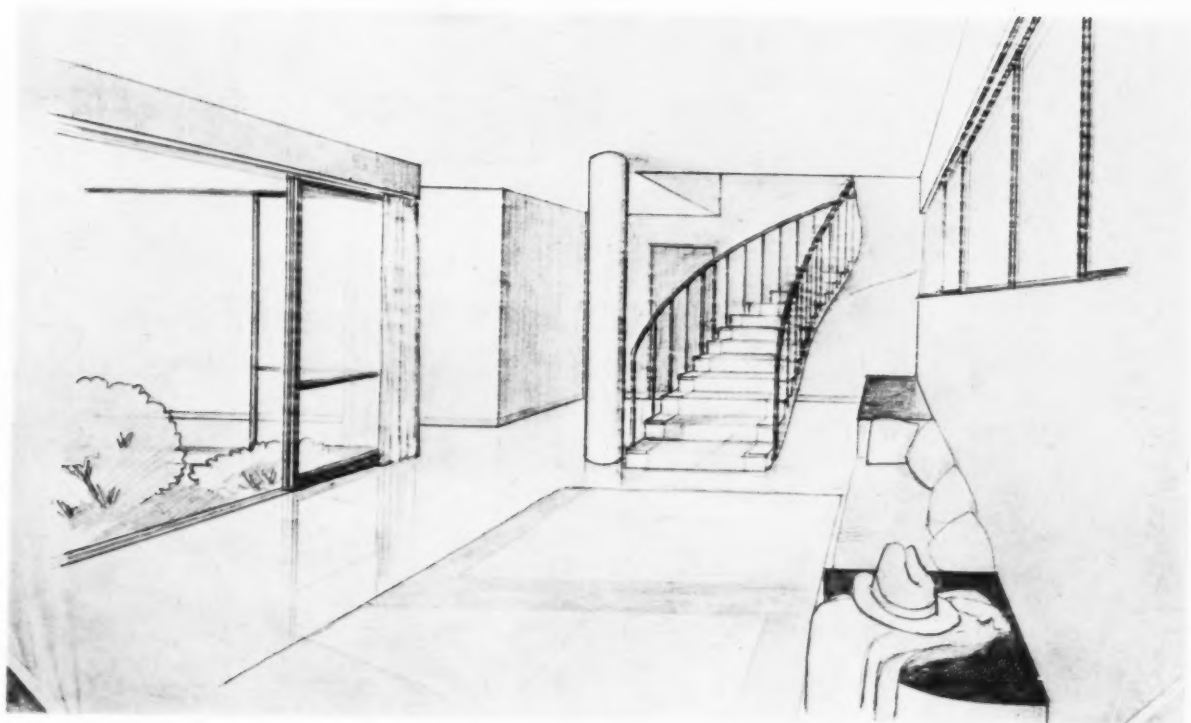
VIEW FROM NORTH WING BALCONY, LOOKING SOUTH



RESIDENCE OF MORINOSUKE KAWASAKI, TOKYO, JAPAN—1933

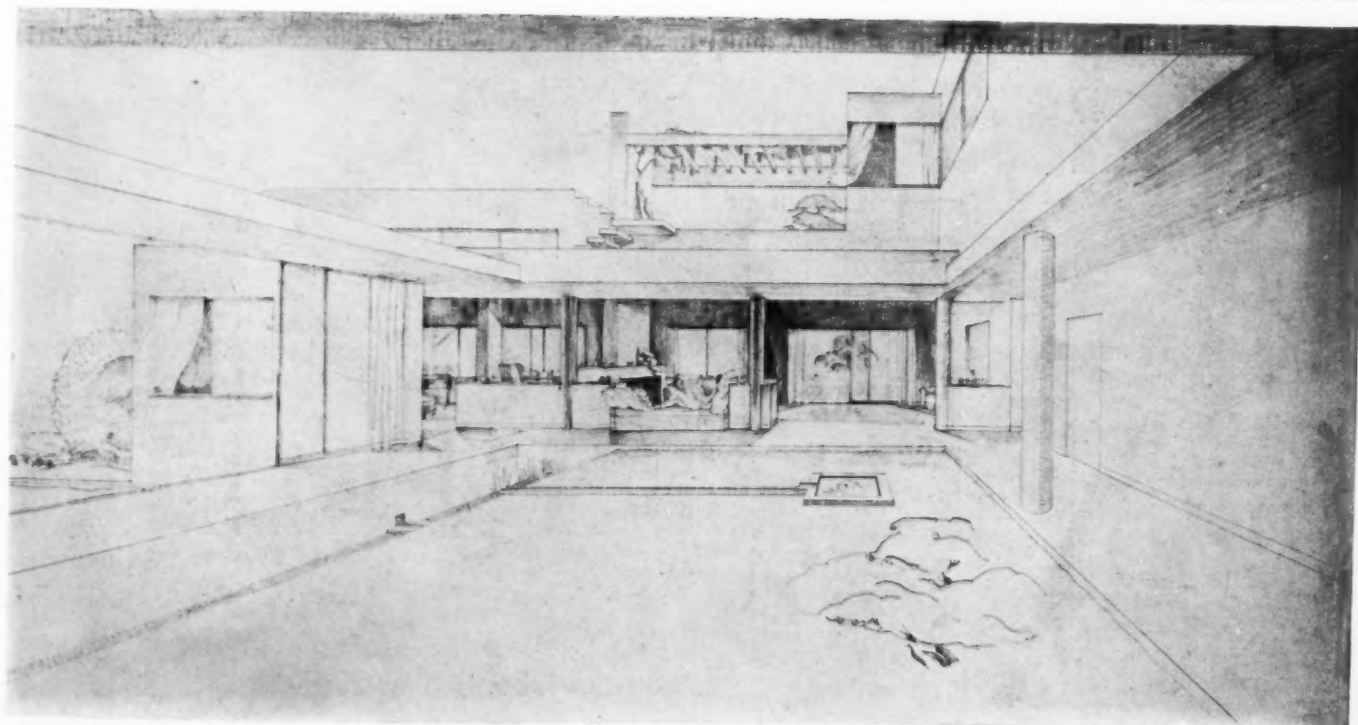
ANTONIN RAYMOND, ARCHITECT

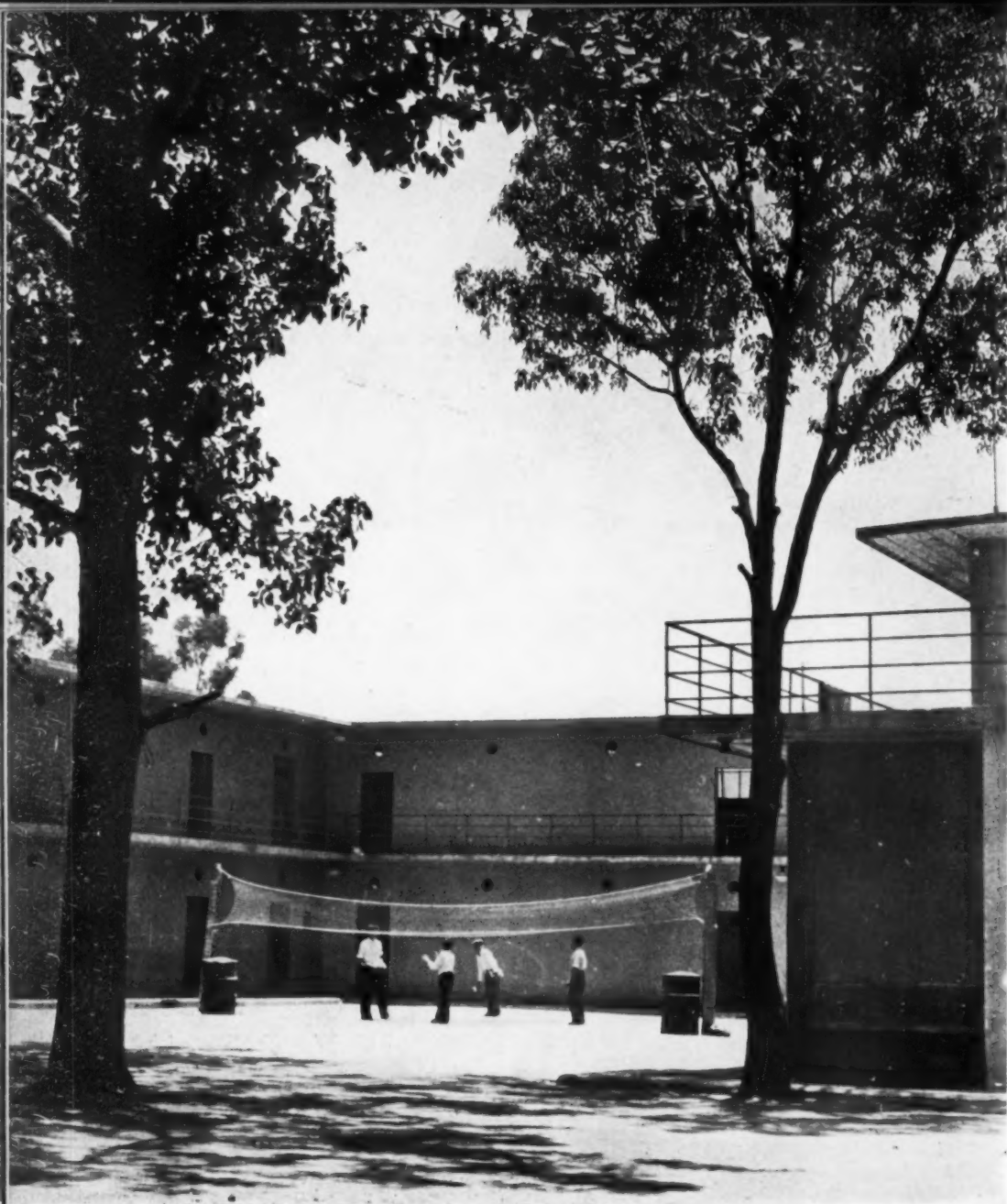




STAIR HALL

INSIDE GARDEN WITH VIEW INTO LIVING ROOM





## FEDERAL SCHOOLS OF MEXICO

JUAN  
O'GORMAN,  
SUPERVISING  
ARCHITECT

PLAYGROUND OF  
SCHOOL IN CO-  
LONIA PORTALES.  
WALLS ARE GREEN,  
GRAY AND BLUE. ALL  
STEEL OF WINDOWS  
AND RAILINGS ARE  
PAINTED A BRILLIANT  
RED VERMILION.

PRIMARY SCHOOL IN THE INDIAN VILLAGE OF ILAHUAC





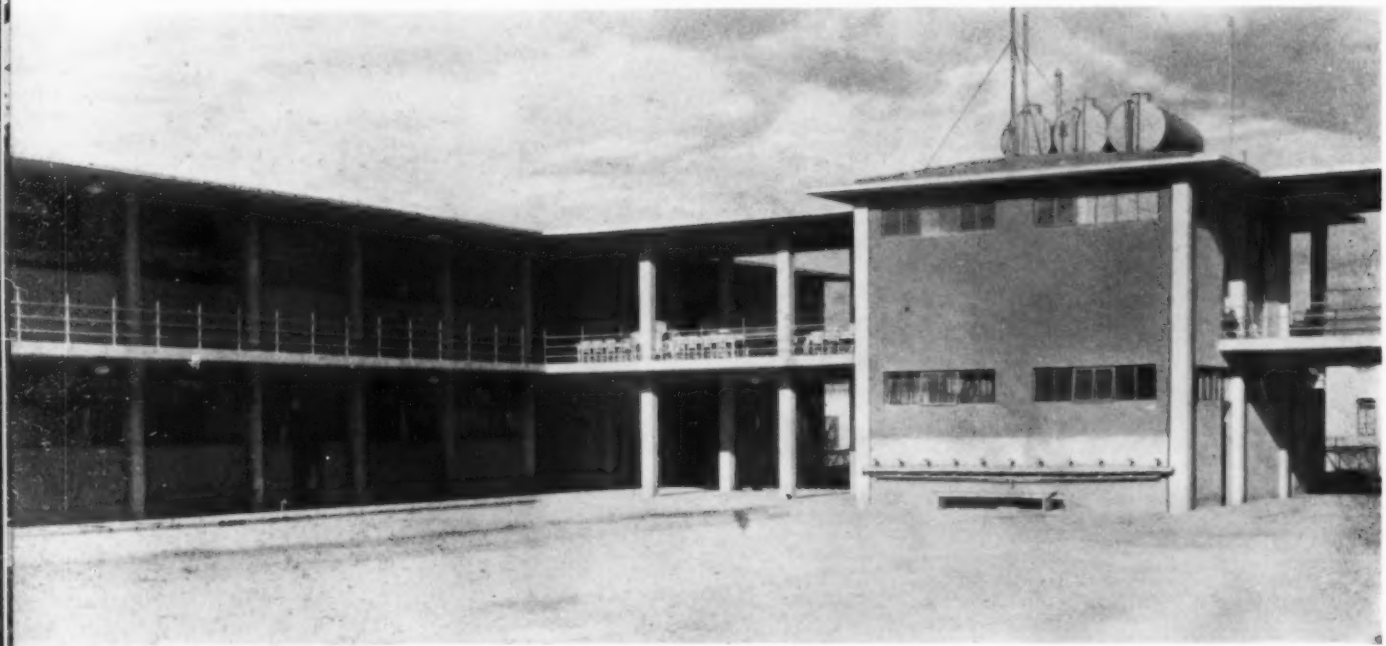
SCHOOL IN INDIAN VILLAGE OF XOCHIMILCO

There has been a distinct shortage in school building in Mexico since 1929 resulting from an expanded educational program dating from that year. A school building program was launched which was intended to bring benefits of education to the popular mass. In some schools morning and afternoon classes were organized in order to remedy the great deficiency in schools and to accommodate the increased demand for primary school education. To rush construction of buildings the Secretary of Public Education in collaboration with the architect, Juan O'Gorman, prepared plans for places where there was most urgent need. Limited funds, only 1,000,000 pesos, less than \$500,000, were made available in 1932 for construction and repair of school buildings. Inhabitants of zones where schools were built lent help by donations of land, materials, labor and money. Elements of construction and planning were made uniform wherever possible. Typical classroom sizes are 6 x 9 meters. Offices for the school principal were standardized at 3 x 3 meters; libraries, the same as for classrooms; clinics 3 x 6 meters; storerooms 3 x 3 or 3 x 6 meters, depending on importance of school. The school house plan was so devised that it could be enlarged without waste of space or crowding. New sections are to be added to ends. Windows face to East and Northeast in order that the sun may enter rooms in the morning. Walls toward corridors are provided with portholes to permit cross ventilation. Floors of classrooms are of asphalt, since this material can be readily kept clean and disinfected. In many schools there is a terrace over the shower room used for sitting and where a radio is installed to broadcast over the play spaces. The same terrace is, in some cases, provided with equipment for projection of "movie" films. The play space is then used to seat people of the village. The exteriors of all buildings are painted in vivid colors—red, orange, rose and green—dark enough to prevent strong heat reflections and glare. Interiors are tinted in light shades.

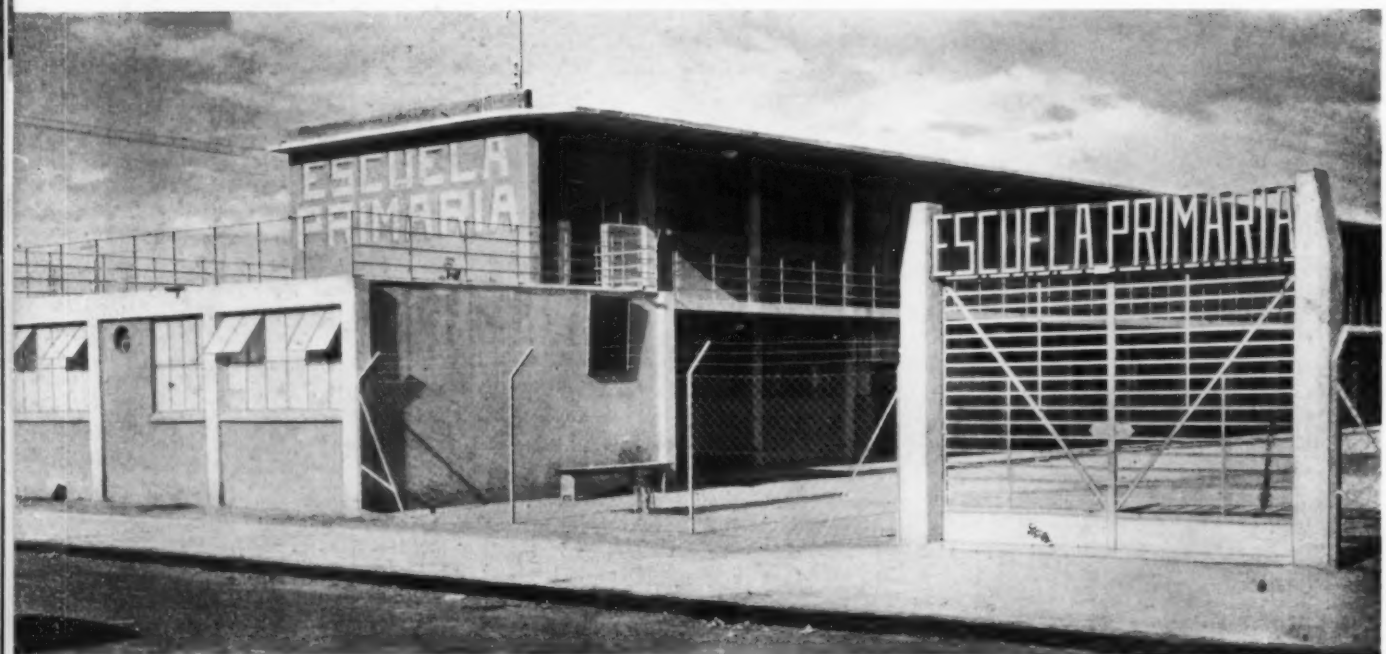




1



2



3

THE ARCHITECTURAL RECORD, MAY 1934

BY

HENRY L. LOGAN

**TECHNICAL NEWS**  
AND  
**RESEARCH**

ELECTRICITY IN THE HOME

# ELECTRICITY IN THE HOME

BY HENRY L. LOGAN

CONSULTING ELECTRICAL ENGINEER

Electricity was originally introduced in the home to provide light. This is still its main function since almost three-quarters of the average residential load is consumed in illumination.

Power to operate time- and labor-reducing devices is being provided on an increasing scale, but the degree to which the public has failed to take advantage of the comfort, protection, health benefits and entertainment possibilities of electricity can be realized only by comparing an adequately electrified home with the "statistical average."

Three times the load that the latter uses for all purposes is devoted, in the case of the former, to comfort requirements alone. The total connected load of the first is nine times that of the second.

The coming decade will reveal great changes in the average home. Reduced current costs are already in effect in some localities and will be the rule, sooner or later, everywhere. Electrical loads that are now out of the question not only will be economically possible, but because efficient use will offset other charges, they will become economically desirable. All homes planned today should include provision for full electrification in order to avoid rapid obsolescence.

The power system of the modern home should make provision for the following items: (See "Super-electrification," page 450.)

## ITEMS FOR POWER PROVISION

### 1 WORK (labor and time-saving equipment)

#### FOOD PREPARATION

Range	
Mixing equipment	Toasters
Percolators	Waffle iron
Portable heaters	Chafing dish
Plate warmers	Pancake griddle
Dish washer	Electric heated service
Refrigerators	Cart (portable steam table)

#### LAUNDERING

Washing machine	Flat irons
Ironing machine	Clothes drier

#### CLEANING

Vacuum cleaners	
Floor waxing machine	Spraying machine



WATER	Pump, in some districts	
<b>2 COMFORT</b>		
AIR CONDITIONING	Oil burner	Air conditioning motors
	Water pump motor	Air conditioning controls
VENTILATION	Exhaust fans	
MISCELLANEOUS	Hair driers	Towel warmers
	Shower heater	Bathroom heaters
<b>3 HEALTH</b>		
ULTRA-VIOLET RADIATION	Sun lamps	
INFRA-RED RADIATION	Heat lamps	
	Warming pads	Mechanical exercisers
<b>4 PROTECTION</b>		
ALARMS	Fire	
	Burglar	
COMMUNICATION	Outside telephones	
	Intercommunicating telephones	
TIME	Clocks	
<b>5 ENTERTAINMENT and RECREATION</b>		
SOUND	Reproducing piano	Radios
VISION	Television	Motion picture
	Equipment	equipment
HOBBIES	Special equipment, such as lawn mowers for gardening, electric hedge cutters, workshop motors, pumps and heaters for aquariums.	
<b>6 ILLUMINATION</b>		
LIGHTING EQUIPMENT	(This will be treated at length in a later issue.)	

The accompanying tabulated data will help the reader to understand the degree of electrification made possible by various connected loads.

**TABLE 1**

CONNECTED LOAD	DESIRABLE DIVISION OF CONNECTED LOAD						TOTAL CONNECTED LOAD FOR SIX-ROOM HOUSE OF AVERAGE 2700 SQ. FT. TOTAL FLOOR AREA	DEGREE OF ELECTRIFICATION
Expressed in watts per square foot of total floor area								
	Light	Work	Comfort	Health	Protection	Leisure		
1.1	0.63	0.33	0.04				2.9 kw	Statistical Average
2.0	1.00	0.60	0.13	0.20		0.07	5.4	Inadequate
4.0	1.75	1.35	0.50	0.25	0.07	0.08	10.8	Minimum
7.0	2.00	1.60	3.00	0.25	0.07	0.08	18.9	Minimum Adequacy
9.0	3.40	2.00	3.00	0.25	0.15	0.20	24.3	Adequate
14.0	4.40	4.90	3.00	0.60	0.20	0.90	37.8	Super
20.0	5.00	10.00	3.00	0.70	0.30	1.00	54.0*	"Home of Tomorrow"

\* Pro-rated to total floor area of 2,700 square feet. The Westinghouse "Home of Tomorrow" has a floor area of approximately 4,000 square feet (total), and a total connected load of 80kw.

The figures in Table I have been related to the total floor area of the home. There is direct justification for this use of an area guide in connection with the lighting load as illumination is generally calculated on a "wattage-per-square-foot" basis. There is not the same direct area relationship to power uses but the area figure is convenient and has worked out accurately for the writer in the examples to which it has been applied and it is hoped that more extended use will prove it reliable.

#### **MINIMUM ELECTRIFICATION**

(4 watts per sq. ft.)

allows for minimum average lighting intensities, small portable kitchen apparatus, refrigerator, washing machine, flat irons, vacuum cleaner, floor waxer, oil burner, exhaust fan, portable fans, sun lamp, heat lamp, warming pad, protective lighting, electric bells, electric clocks, radio equipment and small miscellaneous portable apparatus.

#### **MINIMUM ADEQUATE ELECTRIFICATION**

(7 watts per sq. ft.)

permits all year 'round air conditioning in addition to the above, some improvement in the lighting and an increase in the heavier work devices.

#### **ADEQUATE ELECTRIFICATION**

(9 watts per sq. ft.)

makes generous illumination possible with increased electrification of the kitchen and laundry. (It does not allow for electric cooking or clothes drying.)

#### **SUPER-ELECTRIFICATION**

(14 watts per sq. ft.)

provides optimum visibility conditions, full electrification of the kitchen (including cooking), adequate electrification of the laundry and bathrooms, all year air conditioning, complete accessory ventilation, complete electrical health equipment, full electrical protection, and entertainment.

#### **"HOME OF TOMORROW"**

(20 watts per sq. ft.)

Electrification in this "model" home includes, in addition to the preceding, electrical water heater, clothes drier, sterilizer and hot plate in the laundry, automatic garage door equipment, kitchen range with almost double the average load, separate electrical broiling oven, electrical serving table, shower heater in the bathroom, built-in electrical radiation heaters on third floor, complete range of lighting effects inside and outside and fifty per cent additional provision for miscellaneous portable and semi-fixed electrical devices.

#### **ELECTRIFICATION**

**BY WATTS—SQ. FT.**

The writer is impressed with the possibility that within ten years a six-room home provided with a connected load of less than 19 to 20 kilowatts will be as unrentable and unsalable as an unwired home is today.

The connected load of the adequately electrified small home can only be determined accurately in any given case by a compilation of the wattage consumptions of the noncomplementary electrical equipment to be provided for, so a list is given in Table II. To the connected load so figured should be added, for the illumination, at least 2 and preferably 3 to 3.5 watts per square foot of the total floor area. Allow 17 convenience outlets for portable lamps, and sufficient additional outlets to take care of other portable equipment to be provided (usually a total of 75; see Table 3).

TABLE 2

## WATTAGE OF HOME ELECTRICAL APPLIANCES

FOR USE ON ORDINARY BRANCH CIRCUITS

Air conditioning controls	650 watts
Bottle warmer for nursery	40 "
Clocks	2 "
Cooker	475 "
Curling iron	20 "
Coffee maker	550 "
Dish washer	125 "
Electric blower for heating system	75 "
Electric refrigerator	75 "
Electric towel drier	1000 "
Egg cooker	420 "
Flat irons	660 to 1000 "
Floor waxer	50 "
Grill	475 "
Hair dryer	50 "
Heating pad	60 "
Humidifier	80 to 90 "
Mixer	70 "
Oil burner motor	125 "
Oil burner, including ignition and controls	500 "
Pressure pump	500 "
Radio	100 "
Reproducing piano	400 "
Sewing machine	65 "
Sump pump	200 "
Sun lamp	400 "
Toaster	500 "
Vacuum cleaner	40 to 50 "
Vent fan	50 "
Waffle iron	700 "
Washer	100 to 400 "
Water pump motor	200 "
Automatic garage doors	200 "

FOR USE ON MEDIUM BRANCH CIRCUITS

Ironer	1350 "
Space heaters	1500 "

FOR USE ON HEAVY BRANCH CIRCUITS

Air conditioning motors	3850 "
Clothes drier	4000 "
Electric range	9000 to 14000 "
Electric water heater	1500 to 3000 "

GENERAL DISTRIBUTION OF ELECTRICAL  
OUTLETS IN A SIX-ROOM HOME

TABLE 3

	STATISTICAL AVERAGE HOME	EXCEPTIONAL PRESENT PRACTICE	ADEQUATELY ELECTRIFIED HOME*	WESTINGHOUSE "HOME OF TOMORROW"†
Connected load	3 kw	15 kw	25 kw	80 kw
Convenience outlets	7	36	75	87
Radio outlets	..	..	7	9
Electric clocks	..	1	6	7
Night and burglar lights	..	8	21	24
Pilot lights	..	..	4	4
Lighting outlets	22	70	70-80	113
Telephone outlets	..	..	6	8
Wall switches‡	8	30	52	91†
Door switches	..	7	7	5
Key switches	..	..	2	2
Portable lamps	6	17	17	17
Light bulbs	23	78	90-100**	320**
Electric outlets of all kinds	65	160	240-250	369

\*See first table.

†Exclusive of master switches, switches on portable or fixed machinery and appliances, panel boxes, fuses or circuit breakers (except where latter are "Nofuze" or similar type, constructed as part of wall switches).

\*\*This figure will vary widely.



A well-wired house has been described as "one in which there are outlets equal to the number required for all present and future needs—placed with respect to the uses they will serve—with proper controls properly located and good materials used throughout." The fundamental parts of the home electrical system are illustrated in Figure I.

## A WELL-WIRED HOUSE

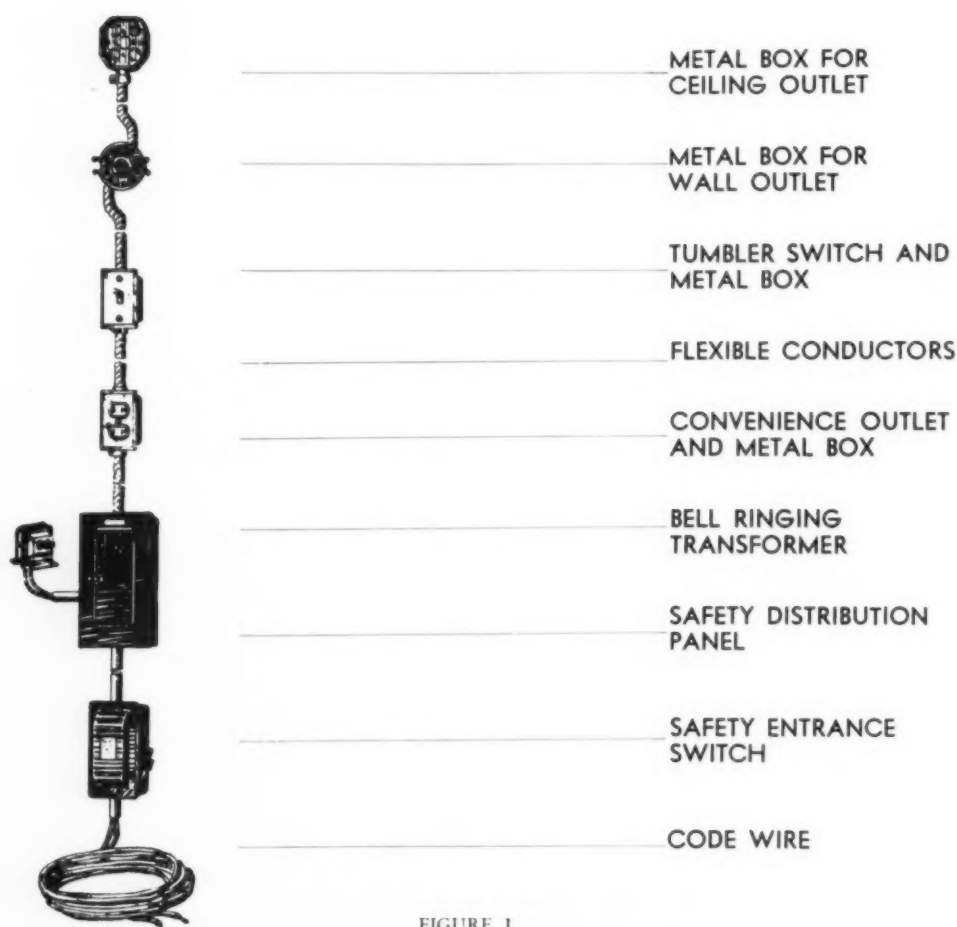


FIGURE I  
Courtesy McGraw Hill Book Publishing Co., Inc.

The panel box should be located in an accessible place such as the rear hall closet, kitchen or pantry. Where the circuits are sufficiently numerous as to require several points of distribution (called "load centers"), these should be similarly located in accessible places. The circuits should be plainly marked at all such panels and load centers.

Distinctive color braids are available and should be employed to identify feeders, lighting circuits, power circuits, burglar alarm systems, radio circuits, signal systems and other special installations. One manufacturer provides the following colors: black, blue, red, green, yellow, brown, orange, white.

In all cases where the load on a circuit can be definitely fixed G.E. Circuit

## ELECTRICAL SYSTEMS

## IDENTIFICATION OF CIRCUITS

**CIRCUIT BREAKERS** Breakers, Westinghouse "Nofuze," or similar devices, instead of old style fuses, should be installed to protect the circuits. The circuit breakers are operated magnetically and open the circuit by releasing a switch mechanism. The circuit remains open until the trouble ceases or is removed. This obviates the necessity of removing blown out fuses but imposes a fixed limit upon the capacity of each circuit that cannot be changed as easily as in the case of a fuse. If, for example, a circuit originally carries 15 amperes and it is desired to increase the load to 20, the protecting fuse can be replaced by a heavier one, but the circuit breakers cannot be adjusted to the heavier load. This inflexibility of circuit breakers has the advantage of preventing unwise loading of circuits and forces a more accurate study of the probable circuit loads in the planning stage.

**WIRING SYSTEMS** **KNOB and TUBE:** This method employs braided, rubber-covered single wire. The wire is supported on porcelain knobs. Porcelain tubes are used when it is necessary to pass through wooden joists, beams or studding. The wires must be separated by at least 5 inches and kept at least 1 inch from the surface on which they are mounted. There are other restrictions that make this method the most expensive due to excessive labor requirements. It is also the poorest system.

**NONMETALLIC SHEATHED CABLE:** This is the most widely used method in present day practice. It uses two conductors separately insulated, contained in an outer sheathing of braided, fibrous or other insulating and protecting material. The cable is run from outlet to outlet in continuous lengths without joints or spliced connections. The cable is fastened directly to the mounting surface by means of metal straps similar to those used for supporting water pipes. It is now available with a special fire-resisting, or flame-retarding, finish, which many local codes require, and which Fire Underwriters will probably require generally in the near future.





































**ARMORED CABLE:** Also in wide use. It consists of a flexible metal cover wound over rubber or other insulated wires. It must be run from outlet to outlet in continuous lengths. It is fastened by water pipe straps. The armored covering is both mechanically and electrically connected to all outlet boxes and fittings.

**CONDUIT:** This consists of insulated wires in rigid metal pipe. The conduit is first put in place and the wires are drawn in afterwards. Conduit wiring is now standard practice in industrial and commercial work (armored cable being used for short extensions only, with an outlet box at every splice). It is the best system and considered the cheapest by many electrical contractors because of the lower labor requirements. It will probably be required eventually for all types of work.

CONDUIT SIZES ARE SHOWN ON THE ACCOMPANYING CHART

## CONDUIT

### WIRES AND CABLES

SIZES OF CONDUIT WITH NUMBER OF WIRES PERMITTED UNDER CODE		
MAXIMUM CAPACITY Single Wire	MAXIMUM CAPACITY Two Wires	MAXIMUM CAPACITY Three Wires
		
		
		
		
		
		
		
		
		
		
		
		

General Electric Co.

### TYPES OF CONDUIT



#### WHITE RIGID CONDUIT

Galvanized under the "Hot-Dipped" process and Glyptal coated



#### BLACK RIGID CONDUIT

Finished in special heavy black enamel. Conduits are furnished in 10-foot lengths, threaded on both ends, with coupling on one end



#### SINGLE STRIP CONDUIT

This is a galvanized flexible steel conduit. Fittings are adapted to each size



#### OVAL TUBING

Available in electro-galvanized finish only. The line of fittings is so designed that interchangeability of airing systems may be effected whenever desired



#### ELECTRICAL METALLIC TUBING

A thin wall rigid raceway made from open-hearth steel and ductile enough for easy installation. Electro-galvanized finish only

# SOME DIFFERENT COMMON TYPES OF WIRES AND CABLES



General Electric Co.



CONDUIT SIZES ARE SHOWN ON THE ACCOMPANYING CHART, P. 454  
Recommended wire sizes are given in Table IV.

## CONDUIT

**BRANCH CIRCUIT WIRE SIZES REQUIRED TO RESTRICT  
VOLTAGE LOSS TO 2 VOLTS (Two Wire, 115 Volt Circuits)** **TABLE 4**

LENGTH OF CIRCUIT IN FEET	WATTS PER CIRCUIT					
	750	1000	1500	1725	2000	3000
	AMPERES PER CIRCUIT					
	6.1	8.7	13.1	15.0*	17.4	26.1
20	14	14	14	14	14	12
30	14	14	14	12	12	10
50	14	12	10	10	10	8
100	10	10	8	8	6	4
150	10	8	6	6	4	4
200	8	6	4	4	4	2

\* Fifteen amperes is the allowable current capacity as set forth in the National Electric Code.

## CIRCUITS

Lighting and appliance branch circuits should be separate so that lights will not go out if an appliance overloads and blows a fuse. The latter should be fed through a power meter where a lower power rate is available.

Ordinary appliance branch circuits are limited to fixed or portable devices rated at not over 1320 watts or 12 amperes, 110 volts; e.g., 1200 watt, 15 pound laundry irons, hot plates, electric towel dryer.

Medium duty appliance branch circuits are for fixed or portable appliances rated at not over 1650 watts, or 15 amperes, usually run with No. 10 wire to laundry, kitchen or bathroom where heavier appliances are customary.

Heavy duty appliance branch circuits are two wire, No. 10, fused at 25 amperes, limited to 250 volt circuits at 20 amperes (electric ranges, etc.).

Two different circuits should be provided for each room so that service to the room will still be available in case of the failure of one circuit.

A separate power circuit should be provided for the oil burner, and another for the air conditioning apparatus.

Extra circuits should be allowed on the panel board for future growth. Appliances not even known to us at present may be developed in the future.

It is well to keep in mind that at some future time the third floor may be furnished into separate rooms and the wiring should be treated in accordance with that consideration.

The size of all conduits should be chosen to permit the future accommodation of conductors having double the current carrying capacity of the initial installation.

Each utility company supplying electrical service establishes rigid requirements governing the materials that must be employed from the utility company's service pole through the meter and service switch to the distribution

## BRANCH CIRCUITS

## ORDINARY APPLIANCE BRANCH CIRCUITS

## MEDIUM DUTY APPLIANCE BRANCH CIRCUITS

## HEAVY DUTY APPLIANCE BRANCH CIRCUITS

## SEPARATE POWER CIRCUITS

## FUTURE GROWTH

## SERVICE ENTRANCES

## OUTLETS

panel. Owners and architects have little opportunity or need to select and specify these materials on their own account. They should consult the utility company and follow the requirements thus established.

Special wall outlets should be provided for fans, ventilators and electric clocks; special radio outlet for aerial and ground connections, and tell-tale pilot lights for the iron, other silent appliances and cellar, entrance and porch lights.

One floor outlet is practically a necessity in the center of the dining room, to permit the use of table appliances and decorative illumination for dinner parties; and one floor outlet in the breakfast room to permit the use of toaster, percolator, and the like, except where the table is the type that stands against a wall when a wall outlet will serve.

Weatherproof convenience outlets should be provided for out of doors.

Duplex receptacles are recommended on all ordinary appliance branch circuits. Mercury tube switches are desirable for bedrooms, bathrooms, intervening hallways, nursery and wherever noiseless operation is desired.

No more than three switches should be placed at any location, to avoid confusion.

The night light system can be controlled from a switch on a flexible cord in the master bedroom.

One locked cabinet should control burglar lights and the wiring for same should be especially concealed.

# HOUSING CONDITIONS IN 7 SMALL CITIES

by THOMAS S. HOLDEN

VICE PRESIDENT IN CHARGE OF  
STATISTICS AND RESEARCH, F. W.  
DODGE CORPORATION

## REAL PROPERTY INVENTORY RESULTS FROM 7 SMALL CITIES

(SUMMARIZED AND COMBINED WITH 1930 CENSUS DATA)

	BOISE, IDAHO	CASPER, WYOMING	BUTTE, MONTANA	ASHEVILLE, N. C.	COLUMBIA, S. C.	NASHUA, N. H.	BURLINGTON, VERMONT
<b>POPULATION:</b>							
1920 . . . . .	21,393	11,477	41,611	28,504	37,524	28,379	22,799
1930 . . . . .	21,544	16,619	39,532	50,193	51,581	31,463	24,789
Per cent increase . . . . .	0.7%	44.8%	-5.0%	76.1%	37.5%	10.7%	8.7%
<b>FAMILIES:</b>							
1930 . . . . .	5,887	4,637	10,119	11,695	11,184	7,593	6,004
1934 . . . . .	6,523	5,045	9,523	12,524	12,380	8,177	6,648
Increase since 1930 . . . . .	636	408	-676	829	1,196	584	644
Extra (double up) . . . . .	366	124	498	1,390	823	637	370
<b>DWELLINGS:</b>							
Total units . . . . .	6,477	5,595	10,727	12,584	12,188	7,946	6,618
Crowded and overcrowded units . . . . .	1,074	1,011	2,551	2,174	3,569	1,097	898
Occupied units . . . . .	6,157	4,921	9,025	11,134	11,557	7,540	6,278
Vacant units . . . . .	320	674	1,702	1,450	631	406	340
Vacant 1 year or more . . . . .	72	238	985	474	61	104	53
Units unfit for use . . . . .	148	262	359	421	170	90	49
<b>AGE AND STRUCTURAL CONDITION:</b>							
Median age . . . . .	25 yrs.	19 yrs.	31 yrs.	15 yrs.	23 yrs.	40 yrs.	39 yrs.
Per cent 30 years or older . . . . .	33%	3%	53%	22%	37%	64%	67%
Per cent needing minor repairs . . . . .	43%	46%	41%	46%	46%	43%	47%
Per cent needing structural repairs . . . . .	15%	20%	24%	23%	19%	11%	9%
Per cent unfit for use . . . . .	2.9%	6.1%	4.9%	3.9%	1.7%	1.9%	1.2%
Per cent masonry construction . . . . .	9%	9%	32%	12%	15%	3%	14%
<b>LACK OF CONVENIENCES:</b>							
Number without central heating . . . . .	3,794	3,615	7,808	7,429	9,988	4,287	2,904
Number without running water . . . . .	499	699	526	623	2,805	69	24
Number without gas or electricity . . . . .	210	477	126	2,434	4,102	59	123
Number without indoor water closets . . . . .	1,364	1,410	2,409	1,958	4,444	224	114
Number without bath tubs or showers . . . . .	1,559	1,721	3,418	3,446	5,252	2,055	1,521
Number without mechanical refrigeration . . . . .	5,170	4,782	9,726	10,571	10,293	8,813	5,550
Number without garages . . . . .	1,678	1,872	3,231	5,233	5,611	2,470	1,758
<b>GARAGES WITH DWELLINGS:</b>							
Number . . . . .	3,462	2,795	4,073	5,571	4,290	2,159	2,474
Car capacity . . . . .	4,241	3,695	5,296	7,437	5,878	5,992	4,295
Cars owned . . . . .	3,857	3,337	4,286	5,113	5,100	3,169	3,113
<b>VEGETABLE GARDENS IN 1933:</b>							
Number . . . . .	970	850	1,177	3,312	1,316	1,358	1,322
<b>OWNED HOMES:</b>							
Number in 1930 . . . . .	2,891	1,844	3,995	4,428	3,496	2,912	2,469
Number in 1934 . . . . .	2,912	1,865	4,084	3,498	3,577	2,868	2,599
Median value 1930 . . . . .	\$3,772	\$3,197	\$2,605	\$5,838	\$5,709	\$5,419	\$6,635
Median value 1934 . . . . .	\$2,815	\$2,214	\$1,927	\$2,485	\$3,604	\$3,692	\$5,802
<b>RENTED HOMES:</b>							
Number in 1930 . . . . .	2,853	2,710	6,060	7,122	7,406	4,528	3,469
Number in 1934 . . . . .	3,565	3,730	6,629	9,086	8,611	5,101	4,319
Median rental 1930 . . . . .	\$26.62	\$25.48	\$25.83	\$23.06	\$14.38	\$22.09	\$25.13
Median rental 1934 . . . . .	\$20.33	\$17.41	\$16.37	\$13.47	\$11.40	\$18.90	\$22.33
<b>ALL HOMES:</b>							
Median rental, including estimated rental value of owned homes, 1930 . . . . .	\$31.30	\$26.80	\$25.22	\$30.00	\$21.96	\$29.20	\$36.13
Same for 1934 . . . . .	\$23.74	\$18.50	\$17.79	\$15.34	\$14.44	\$22.87	\$28.12

**T**HE U. S. Department of Commerce has released preliminary statements on the results of seven real property inventories taken in the earlier months of this year. The seven cities thus far reported are all small cities, ranging from 16,000 to 51,000 in population in 1930. Three are in the Rocky Mountain States (Boise, Butte and Casper), two in the Carolinas (Asheville and Columbia), and two in New England (Nashua and Burlington). It is obvious that the data furnished by these seven cities are too limited for general conclusions, but it is worth while to summarize the figures that are at hand. Such a summary can indicate a method of study of later survey reports, and may point to some tentative observations of value in reaching conclusions on more complete data to be obtained when more cities have been reported on.

**POPULATION AND FAMILIES:** Five of the cities were growing cities from 1920 to 1930; Boise, Idaho, was stationary; Butte, Montana, lost population. All but Butte gained in population from 1930 to 1934, and Butte continued to lose. It is significant to note that the other six cities gained 4,277 families and that they have 3,710 extra families living doubled-up in family quarters. It raises a suspicion that the population gains consisted very largely of unemployed persons who left the larger cities to go back to the small towns and live with relatives.

**DWELLINGS (Housing shortages and surpluses):** The seven cities have 60,820 families and 62,135 dwelling units, of which 1,498 are rated as unfit for use. In five cities the number of families exceeds the number of dwelling units rated as fit for occupancy: Boise, Asheville, Columbia, Nashua, and Burlington. On this showing it may be concluded that these five cities have real housing shortages; just how effective the immediate demand would be is dependent on the permanency of the new population and the important question as to whether the overcrowded families are financially able to build or rent new quarters. In Casper the excess of habitable dwellings over families is 15 per cent; in Butte, 9 per cent. Even in these two cities the proportion of crowded dwelling units is practically the same as in the other five. It is to be noted that Butte is the only city in which dwelling units vacant 1 year or more greatly exceed the number rated as unfit for use.

**AGE AND STRUCTURAL CONDITION (The market for repair work):** All the cities have large numbers of buildings needing minor repairs, the percentages of such buildings ranging from 41 per cent to 47 per cent. Here is a potential market for small work, in so far as the properties and their owners can stand the expense.

There is a very striking variation in the percentage of buildings needing structural repairs; the lowest percentage being in Nashua and Burlington, which have many more old buildings than the other cities. The city with the fewest old buildings, Asheville, has the second highest percentage of buildings needing structural repairs. Obsolescence is thus much less a matter of age than of sound structure and proper maintenance. There does not seem to be any defi-



nite relationship between the need for structural repairs and the proportion of masonry structures.

**MODERN CONVENIENCES:** On the matter of central heating, variations of climate are an important factor, as between the seven cities. Nashua and Burlington have rather surprisingly large numbers of houses without central heating, and rather high standards in other respects, including relatively high rent and property value scales. On this indication there would appear to be a market for modern heating units in these two towns. With respect to other modern conveniences, it is impossible to state from the evidence shown whether their lack indicates any large potential market or merely a low living standard. Comparison of these figures with the prevailing rent scales inclines one toward the latter conclusion. Lack of garages does not indicate much demand for new garages if we compare the figures lower down in the table which show the car capacity of existing garages well above the number of cars owned.

**VEGETABLE GARDENS:** One family in every six had a vegetable garden in 1933. The largest proportion of families having gardens was found in Asheville, where rent drops were worst and other factors indicate depressed conditions and low living standards; the large number of gardens probably indicates a large proportion of subsistence gardening. Such figures as these will be extremely valuable if collected again at a later date to indicate whether there is a trend toward greater interest in gardens. It will be interesting to compare with these the figures for the larger cities.

**HOME OWNERSHIP:** The numbers of owned homes remained practically the same since 1930 in all the cities, whereas the numbers of rented homes (including vacant ones for rent) increased. Even reduced values and low construction costs have not tended to increase ownership.

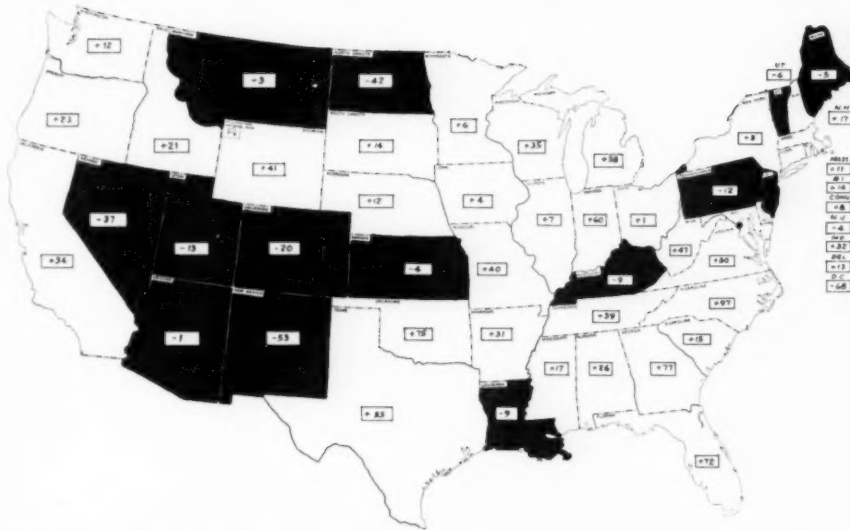
**VALUES AND RENTALS:** The median values shown are only rough indicators, but useful for comparative purposes. The greatest deflation in values and rentals took place in Asheville, the least in Burlington. In 1934, median values were under \$3,000 in 4 out of the 7 cities; median rentals were less than \$20 per month in 5 out of the seven. The figures here given on estimated rental equivalents of all homes are merely a device for setting up a single index for comparisons as between the cities. They are partial indices of incomes and living standards of the communities, and should be so considered in connection with the figures on lack of modern conveniences.

**GENERAL CONCLUSION:** These 7 reports indicate the existence within the 7 cities of potential demand for new houses, for minor repairs, for structural repairs and, possibly, for modernization. Immediate demand is limited by fairly low living standards in some of the places and by current conditions of employment and income of the people. Credit on easy terms would probably develop a reasonable amount of business.

The indications as to rentals and lack of modern facilities should be of interest to the sociologist as well as to the architect, the builder and the real estate man. They indicate a future potential demand that is dependent on considerable increases in the incomes of the people.

# BUILDING TRENDS AND OUTLOOK

BY L. SETH SCHNITMAN  
CHIEF STATISTICIAN  
F. W. DODGE CORPORATION



BUILDING DURING 12 MONTHS—APRIL, 1933—MARCH, 1934, INCLUSIVE. Corresponding twelve months ended March, 1933, taken as base. SHADED AREA: BELOW BASE. UNSHADED AREA: ABOVE BASE. Figures denote percentage change from base. Floor space for new building contracts, 37 states east of the Rocky Mountains. Permit valuations for Rocky Mountain and Pacific coast states. Map, copyright American Map Co., N. Y. Authorized reproduction No. 5025.

## PRIVATE CONSTRUCTION SHOWS GAIN

### MATERIAL PRICE MEASURING ROD

F. W. DODGE CORPORATION  
COMPOSITE PRICES

MATERIAL	This Month	Month Ago	Year Ago
Portland Cement . .	\$2.30	\$2.26	\$2.05
Common Brick . . .	12.36	12.36	11.70
Structural Steel . .	1.65	1.65	1.60
Lumber . . . . .	16.48	16.50	15.48

The prices in this tabulation enable one to visualize at a glance the main trend of the material market. Their significance does not extend beyond that point, and the explanation should be read carefully.

Prices given in this comparison are composite and do not in all cases refer to one item. For instance, the price of structural steel is the composite of prices of shapes and plates f.o.b. Pittsburgh; the price of lumber is a composite of five items of Southern pine and five items of Douglas fir f.o.b. mill; the price of cement is a composite of prices in fourteen different cities per barrel, carload lots, to contractors; price of brick is composite in fourteen cities per M, delivered on the job.

Construction awards reported in the 37 Eastern States during April were more than twice as large as those recorded for April, 1933, but registered a decline of 26 per cent from the volume shown for March of this year. Gains over a year ago were shown in each of the thirteen major territories of the area east of the Rocky Mountains. Declines from the preceding month were recorded in all territories except New England, the Central Northwest and Southern Michigan.

Privately-financed construction awards in April totaled \$56,252,900. This was a higher volume for private construction projects than has been reported for any month since August, 1933, and compares with \$52,405,600 for March of this year and only \$38,933,800 for April, 1933. At the same time publicly-financed contracts totaled \$75,158,900 in April; this was a decline of about 40 per cent from the volume registered in March, but was more than four times as great as the total reported in April of last year, before the advent of the PWA program.

Total contracts for construction in the 37 Eastern States, both public and private, let during the elapsed four months of 1934 amounted to \$592,937,600. This contrasts with a total of only \$252,599,800 for the corresponding four months of 1933.

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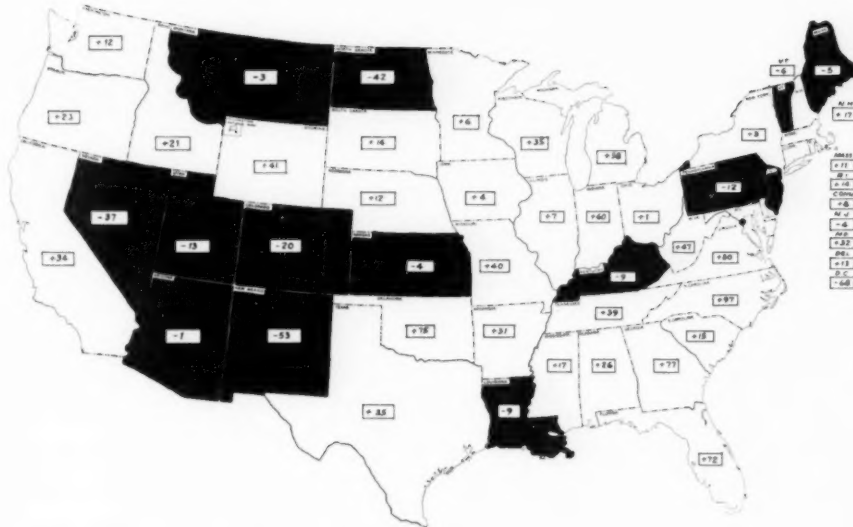
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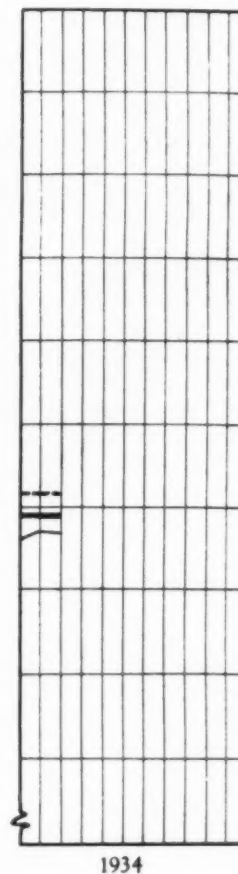
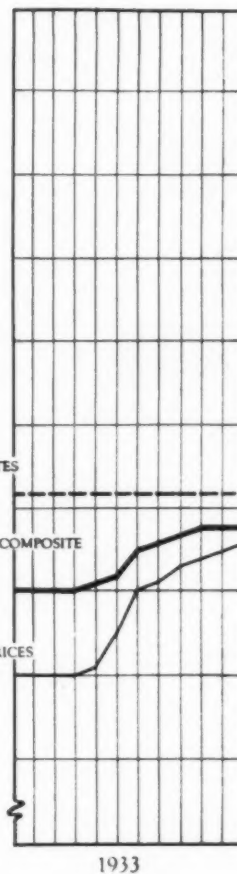
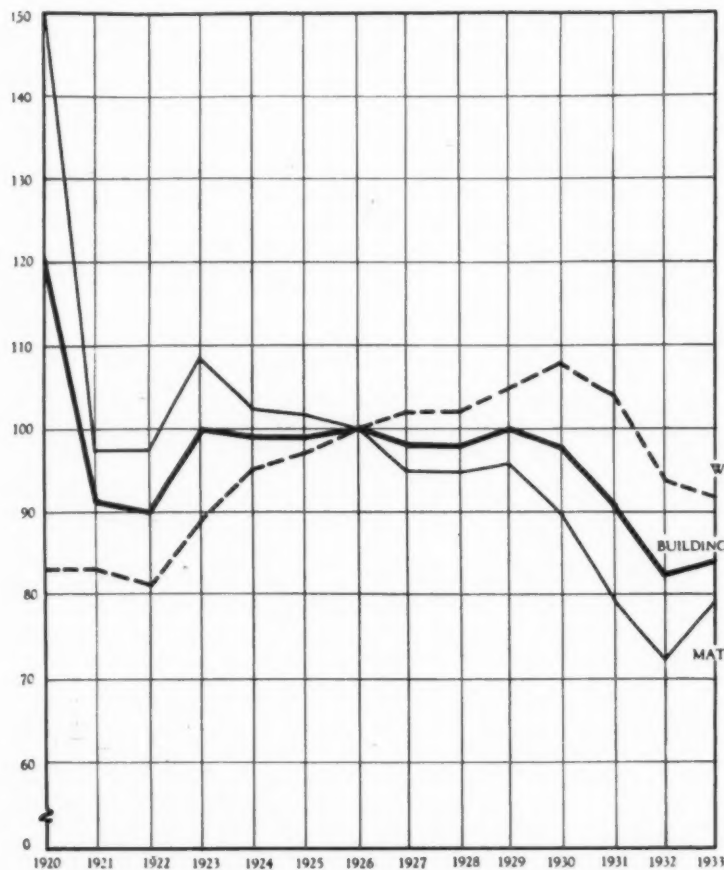
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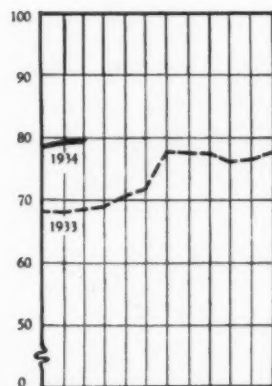
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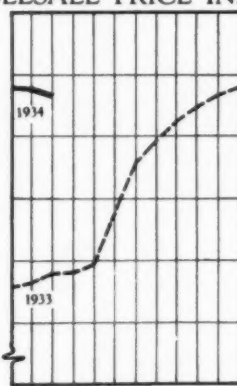




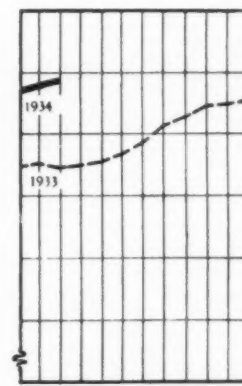
#### WHOLESALE PRICE INDEXES



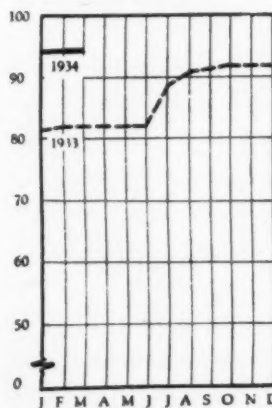
**PAINT MATERIALS**  
There is little likelihood of further important price advances over nearby months.



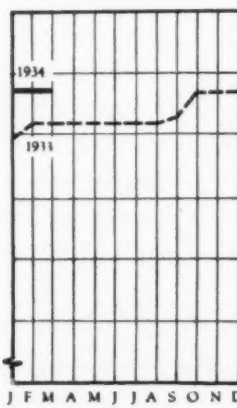
**LUMBER**  
Lumber prices have about reached the level where important sales resistance must be encountered.



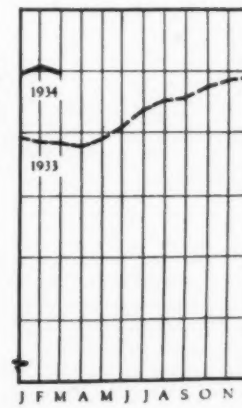
**BRICK AND TILE**  
Prices for clay products appear to be nearing point where they will mark the beginning of a declining tendency.



**CEMENT**  
No important advances in cement from current levels appear likely in nearby future.



**STEEL**  
Prices for structural shapes appear to have stabilized at current levels for the nearby months.



**OTHER MATERIALS**  
The limit of the recent recovery in building material prices seems to have been reached for the time being.

1926 MONTHLY AVERAGE = 100

#### MATERIAL PRICES, BUILDING WAGE RATES AND BUILDING COSTS COMPARED

# Constructed of COPPER AND BRONZE THROUGHOUT

## PENBERTHY AUTOMATIC ELECTRIC SUMP PUMPS



Maximum Capacity  
3600 Gals. per Hr.

**Model K**  
Made in 5 Sizes  
Retail Price  
(Size No. 1 K)  
**\$65.00**



Maximum Capacity  
1400 Gals. per Hr.

**Model 33**  
Made in 1 Size only  
Retail Price  
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Their performance is as superior as the materials from which they are made. There is a Penberthy Pump for every purpose . . . and to suit every pocketbook.

## PENBERTHY INJECTOR COMPANY

Manufacturers of Quality Products Since 1886

Detroit, Michigan

Windsor, Ontario



SELECT  
THE  
PUMP  
THAT  
SUITS  
THE  
PARTICULAR  
CONDITIONS

DON'T  
TRY  
TO  
SUIT  
THE  
CONDITIONS  
TO  
A  
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## PENBERTHY AUTOMATIC CELLAR DRAINERS (Water and Steam Operated)



**MODEL S**  
Made in 1 Size Only  
Maximum Capacity  
600 gallons per hour  
Retail Price . . \$14.50



**MODEL R**  
Made in 2 Sizes

	Max. Cap. gal. per hr.	Retail Price
1R	720	\$25.00
2R	1240	40.00



**MODEL L**  
Made in 3 Sizes

	Max. Cap. gal. per hr.	Retail Price
3L	1650	\$ 55.00
4L	2400	80.00
5L	3200	110.00

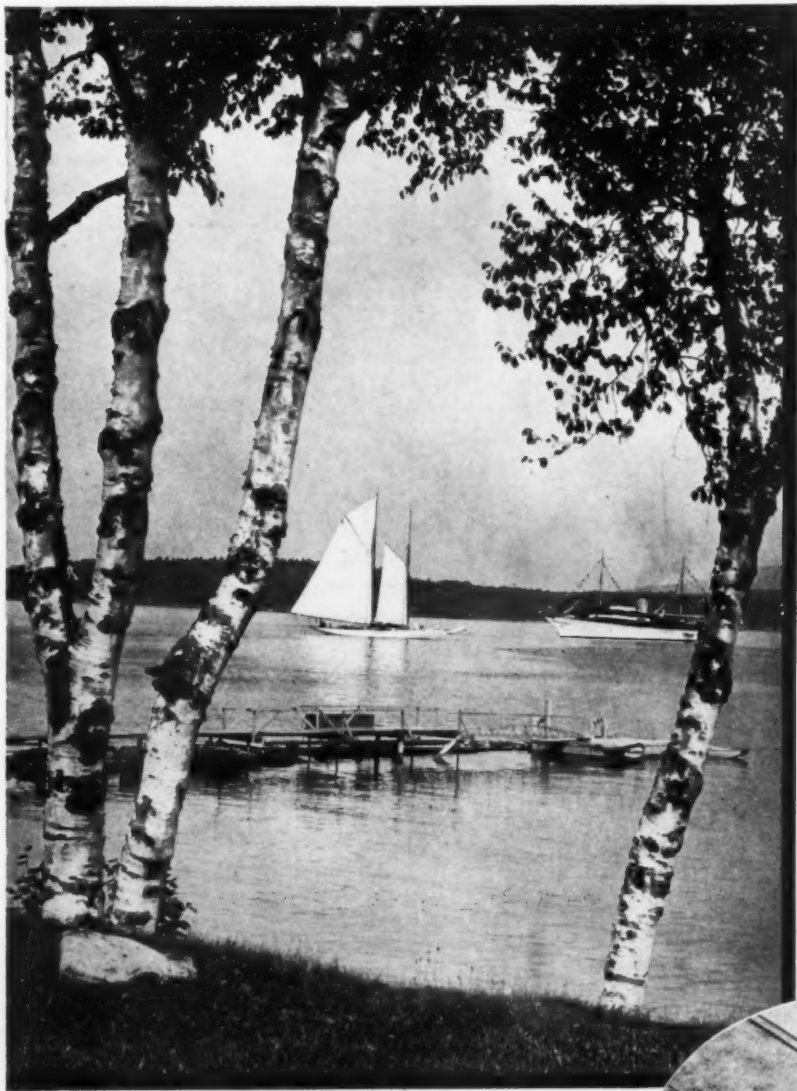
ALL PRICES ARE F.O.B. DETROIT

PENBERTHY PUMPS REMOVE SEEPAGE WATER

p. 463 missing, Sept 9/33

PENNVERNON WINDOW GLASS IS TRUE TO THE VIEW

*A scene like this demands  
a quality window glass to transmit  
it accurately*



ARCHITECTS and builders today give careful consideration to the environment of the buildings they construct . . . they place and space their windows with the surrounding views in mind. It is very important that these windows be glazed with a window glass that will transmit the view accurately.

Pennvernon is such a window glass. It is unusually transparent, remarkably free from defects, fully capable of transmitting natural colors without change or weakening. And therefore it affords exceptionally clear, undistorted vision. Pennvernon possesses also a brilliant beauty of surface . . . on both sides of the sheet . . . that adds to the exterior beauty of a building. All these superior qualities result from the special method used to make Pennvernon Window Glass.

Specify the glass that's true to the view . . . Pennvernon. It is available in single and double strength, and in thicknesses of  $\frac{3}{16}$ " and  $\frac{1}{32}$ ", at the warehouses of the Pittsburgh Plate Glass Company in all principal cities and through progressive glass jobbers and sash and door manufacturers. Pittsburgh Plate Glass Company, Grant Building, Pittsburgh, Penna.



**PENNVERNON  
WINDOW GLASS**

*The color of the Pennvernon label tells strength and quality immediately. A glance at a job tells you whether or not your glass specifications have been met exactly.*





# New Developments: The Rapid Development of Patina on Copper

BY JOHN R. FREEMAN, JR.

At the suggestion of architects, the Copper & Brass Research Association in 1928 undertook a systematic and fundamental investigation of the nature of copper patina and methods of producing it.

One of the early discoveries in this investigation was the composition of the patina. It was commonly understood, and traditionally referred to, as a basic carbonate of copper which is the mineral malachite. This, no doubt, accounts for the general reference to its color as malachite green. Chemical analysis of specimens taken from roofs of various structures in Southern New England and New York City, and also in rural, industrial and marine locations have shown the patina to be not a basic carbonate but almost a pure basic sulfate practically identical with the mineral brochantite. Results of similar analyses by English investigators of numerous samples of very old patina in Great Britain showed the same surprising results. This composition of the patina no doubt arises from the large quantities of sulfur dioxide discharged into our atmosphere, particularly in industrial centers, from the burning of the sulfur normally present in coal and fuel oils, and borne by the wind into remote rural areas.

With this discovery, it was evident that all previous methods of rapidly producing the patina on a copper surface were based on a false premise. The investigation was then directed toward the rapid production of a patina identical chemically with that which forms by natural weathering. This has been accomplished. It is now possible, with reasonable assurance of success, to produce in a few hours on copper surfaces either before or after installation, a patina identical in composition with that which forms by natural weathering. Exposure tests extending over a period of more than two years indicate the patina so formed to be permanent.

\*THE RAPID DEVELOPMENT OF PATINA ON COPPER—Freeman, John R., Jr., and Kirby, P. H. METALS AND ALLOYS, September, 1932.

The method of producing patina on copper surfaces in shapes such as spandrels has been described previously in detail.\* The process consisted essentially in repeated immersion of the copper surface to be colored in a hot ammonium sulfate solution which had been properly conditioned by adjusting the acidity to a predetermined value. This is readily accomplished by suitable additions of small amounts of copper sulfate and concentrated ammonium hydroxide.

The more recent development of "patinating" copper surfaces after installation is an adaptation of the alternate immersion process. The same chemical solution is used. The difference is primarily in the method of application of the solution. This involves a very definite technique which must be closely followed to obtain dependable results.

The chemicals are applied by a series of sprayings. The following procedure, in preparation and application of spray, has been found to be the most satisfactory. The data are given in sufficient detail to permit trial by any one interested.\*\*

\*\*The use of ammonium sulfate for patinating copper is covered by U. S. Patent No. 1,951,304 and Canadian Patent No. 334,996. The Copper and Brass Research Association is making its use available to all users of copper from member companies.

The following amounts will make about 110 gallons of solution. Proportionate amounts should be used for smaller quantities. For estimating purposes it is safe to assume that one gallon will treat 150 square feet of surface in ordinary weather. *All measurements must be exact.*

## MATERIALS REQUIRED

- 90 lb. ammonium sulphate—technical grade. (Agricultural grade may be used but its use requires filtering of solution because of contained impurities.)
- 3 lb. crystallized copper sulphate (blue vitriol).
- 1 lb. 3 oz. concentrated ammonia (specific gravity 0.90). This is equivalent to 21.1 fluid ounces.
- 100 gallons clear water.

## PREPARATION OF SOLUTION

**IMPORTANT:** No iron or metal containers, except lead, should be used for preparing or storing solution. Wooden barrels or tubs are satisfactory.

Dissolve the 90 lb. of ammonium sulphate in the 100 gallons of clear water. Dissolution should be complete.

Then add the 3 lb. of copper sulphate to the above solution of ammonium sulphate. This is best done by removing a few gallons of the above solution and



dissolving in it as much of the copper sulphate as possible, returning this to the original volume. Repeat this procedure until all of the copper sulphate is dissolved.

Then add *slowly* with *constant stirring* the 1 lb. 3 oz. (21.1 fluid ounces) of concentrated ammonia to the above solution of ammonium sulphate and copper sulphate. It is *especially important* that the ammonia be measured exactly. (The ratio of 1 lb. 3 oz. of ammonia to 100 gallons of water *must* be maintained in preparing this, and smaller or larger amounts.)

The copper surface to be colored should be free from oil and grease and any accumulation of dirt incident to installation. This can be readily accomplished by washing with an alkali solution such as sodium carbonate or lye, followed by washing with clear water to remove the alkali. The copper should then preferably weather for a few days to develop a brown tarnish. The adherence of the patina appears to be better when applied to a tarnished surface than if developed on a polished or bright pickled surface. The length of time will, of course, depend upon conditions, but two or three rainstorms have proved adequate. The rain also helps to remove traces of the alkali cleaning solution. The solution is applied by spraying. An ordinary knapsack garden sprayer as used for insecticides, the inside of which is coated with bituminous paint, has proved satisfactory. The spray should be applied rapidly and in such manner that, after spraying, the solution rests on the copper surface in isolated droplets. This can be readily accomplished with a little practice. It is better to apply too little than too much, since with an excess, large drops tend to accumulate and on running down over the surface may cause streaks.

Five sprayings have been found adequate. Between each spraying sufficient time should be allowed to permit drying. This will depend upon weather conditions. On a warm sunny day, ten to fifteen minutes is sufficient; on cloudy days a longer period is obviously required. Areas in heavy shadow or sheltered from wind will also require a somewhat longer drying period. Upon completion of the five applications, the copper surface should be coated with a thin glassy-appearing film of the deposited salt. Color may not be apparent, as it develops more or less gradually, although when application is made on humid days or in shaded areas, where drying is slow, appreciable color may be apparent before all applications have been completed.

The ideal conditions are a sunny day followed by a moderate to heavy dew or a "dripping" fog. With these conditions the color will begin to appear in a few hours. Complete coloring finally appears with the first storm subsequent to application of the solution, the rain washing off the excess chemical.

The patina as it first develops has a bluish cast due, probably, to the presence of copper ammonium compounds. On weathering, this disappears, the color approaching the jade green of natural patina.

It should be stated that the above method has been applied using a simple ammonium sulphate solution instead of the "conditioned" solution as described in detail above. A satisfactory patina is developed but it does not appear to have as good adherence as when the "conditioned" solution is used.

The success of the coloring treatment is appreciably dependent on atmospheric conditions subsequent to the application of the coloring solution. It is essential, subsequent to final application of the spray and prior to the first rainfall, that a relative humidity of over 75 per cent prevail in the atmosphere for about three hours, or that there be a dew fall. These conditions are essential in order to provide moisture for the chemical to attack the surface of the copper.


These requirements may appear at first rather limiting in practical application when the vagaries of the weather must be depended upon. A dew fall, however, is an almost nightly occurrence in summer weather, and fogs or conditions of high humidity are of frequent and quite regular occurrence in many parts of the country, particularly at certain seasons of the year. Also on overcast and cloudy days, and preceding a rain storm, the relative humidity is high.

It is to be noted further that in the event a sudden shower or rain washes off the chemicals prior to completion of the coloring action, the process can be repeated. The cost of chemicals is very low, practically negligible; the principal item is labor cost. This will depend upon accessibility of the surface for application of the spray.

#### CLEANING THE SURFACE AND METHOD OF APPLICATION

#### WEATHERING

#### INFLUENCE OF WEATHER ON PATINA DEVELOPMENT



# ALL YOUR PIPE REQUIREMENTS

## with J&L QUALITY

J&L Steel Pipe is straight and free from excess scale and injurious defects. It has accurate, clean-cut threads and the couplings are sound and correctly tapped. Galvanizing is thoroughly done, and it will not flake off.

The user enjoys the full advantage of these features because the steel—produced under complete J&L ownership control—is of such uniformly high quality. It is the medium which preserves the superiorities of pipe manufacture and assures excellent performance.

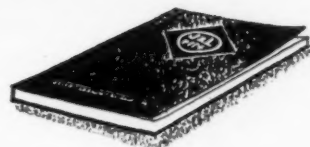
J&L Steel Pipe is supplied, black and galvanized, in a full range of standard weights and sizes: welded  $\frac{1}{8}$ " nominal to 16" O.D. inclusive, seamless  $\frac{1}{2}$ " nominal and larger. J&L Copper Steel Pipe can be supplied where increased resistance to atmospheric corrosion is required.

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STANDARD STRUCTURAL SHAPES  
STEEL PILING — NAILS — TIE WIRE  
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J&L  
PIPE

# J&L STEEL

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AMERICAN IRON AND STEEL WORKS

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At last America gets  
a new Bath Thrill—



Pat. No. 1,844,988

Now you can really do something different in bathroom design! The New "Standard" Neo-Angle Bath offers you this opportunity because it is so distinctive, so smart... yet, so practical... that every homeowner will be enthusiastic about its convenience, its safety, its comfort and its roominess. It's almost square—with the tub set diagonally to provide seats in opposite corners. It

combines every type of bathing in a single one-piece fixture.

Here is a fixture that will create a new enthusiasm for better bathrooms. It offers unlimited opportunities for unusual designs. See the "Standard" Neo-Angle Bath at the nearest "Standard" showroom. Write today for complete information and literature.

\* Price includes bath in white regular enamel, complete with bath and shower fitting. Plus local delivery and installation by your registered master plumber. Pacific Coast Price \$116.50, Time Payments Available.

Price subject to change without notice.

**Standard Sanitary Mfg. Co.**  
PITTSBURGH, PA.

Division of AMERICAN RADIATOR & STANDARD SANITARY CORPORATION



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# NEW MATERIALS & EQUIPMENT

NEW CATALOGS

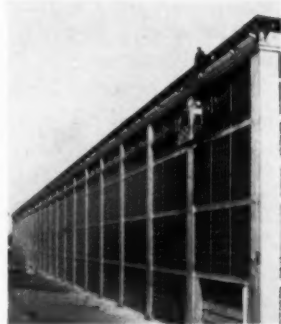
RESEARCH REPORTS

MANUFACTURERS' LITERATURE

Architects are invited to use the coupon on this page as a convenient means of obtaining manufacturers' publications describing in detail the products and materials mentioned

E1

## STEELBEAM TRACK



A Steelbeam track for window washing is produced by Richards-Wilcox Manufacturing Company of Aurora, Ill. This device eliminates the usual hazards of window washing in commercial and industrial buildings, at the same time permitting more efficient cleaning at reduced expense.

The installation illustrated is on a building 550 feet long, 150 feet wide and 70 feet high, having approximately 90,000 square feet of glass to wash. The Steelbeam track extends entirely around the building, and two cages are used, each manned by a crew of two workers.

E2

## NEW NON-RUSTING SHINGLE NAIL

Since shingles can never last longer than the nails which hold them, the W. H. Maze Company, Peru, Ill., have developed a non-rusting shingle nail so made that, according to the manufacturer, it will withstand the severe exposure of roof work for periods upward of 50 years.

It is claimed that this new nail has the lasting properties of solid zinc and will therefore outlast the ordinary galvanized nail by many years. The new coating is zinc and is duplex in nature: the under coating being a zinc-iron alloy necessary for adherence; the outer coating being pure, virgin zinc which is practically unaffected by air and moisture.

## To Obtain Further Information

about any products mentioned, write the index numbers in space below. For literature about products advertised in this issue, give name of the product and manufacturer. Return coupon to The Architectural Record, 119 West 40th Street, New York, N. Y.

Name \_\_\_\_\_

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E3

## LIGHT

The General Electric Company is releasing the Institute number of "The Magazine of Light." In it are discussed the variety of commercial and architectural applications of light featuring those uses which are demonstrated at the General Electric Institute at Nela Park, Cleveland, Ohio. Several articles by the executive managers of the different departments are featured in this publication. Also included are a number of photographs illustrating correct lighting in homes, stores, theaters and other types of buildings.

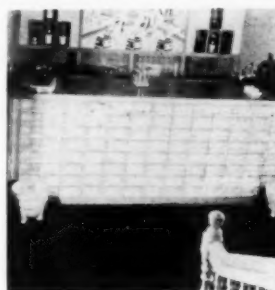
E4

## LIGHTING WITH PERMAFLECTORS

Principally for use in department stores, Permaflexor lighting is said to achieve an even diffusion of light, elimination of glare caused by globes and similar exposed fixtures, reduced labor and cost in lighting fixture cleaning and in general maintenance. It is an indirect type of lighting employing silver plated glass reflectors completely incased in box-type luminaries generally mounted on stock cases. Indirect floor lamps and counter lamps employing the same principles of construction are also used. The Permaflexor is manufactured by the Pittsburgh Reflector Company.

E5

## COLORFUL GLASS BLOCK BARS



Owens-Illinois glass blocks are being used for construction of economical bars appropriate for clubs, hotels, restaurants and private homes. Decorative lighting effects can be obtained either by placing electric lights directly behind the glass-block bar-wall or simply by allowing the lights of the room to reflect from the interior colored surfaces of the blocks. When the glass-block bar-wall is laid up the only other requirements are a wooden counter and the ordinary sheet-metal drains.

The ease and pliancy with which glass blocks can be applied to fit available space and also the low cost of the material itself are advantages in providing, economically, a modern piece of equipment.





#### E6

##### THE NEO-ANGLE BATHTUB

Modifying the shape of the bathtub for the first time since the original stationary tub was installed in 1841, Standard Sanitary Manufacturing Company has placed on the market a four-foot square tub with a diagonal bathing recess, an integral shower seat and a second seat to be used upon entering or leaving the tub.

The tub makes possible greater architectural variation in the bathroom, and widens the latitude for decorative treatment, in addition to providing a fixture which takes into account consumer desires regarding convenience. The bathing recess is the same length as that in a five and one-half foot tub of conventional design, and five inches wider, as the roll on the bottom has been eliminated. Sold complete with shower and fittings, the tub is furnished in white and in ten colors. It is known as the Neo-Angle Bathtub.

Seats on either side of the tub are intended not only as a shower seat and as a seat that will make it unnecessary to balance on one foot when stepping into the tub, but as general utility seats while taking a tub bath. They serve also as seats for a foot bath and in the case of the front part, as a seat for a mother while bathing children. Also they can be used as shelves to hold brushes, towels and other items.

Virtually square in shape, the tub can be placed across one end of a long, narrow room, or can be fitted into a square or odd space. Because of the width of the fixture, splash from the shower is kept inside the tub with the shower directed toward the back. The variety of finishes suitable for a bathroom is greatly increased, while the cost of these finishes can be decreased as the need for waterproofing is minimized and confined largely to the area around the tub. The fixture is two inches lower than con-

ventional tubs, but the depth of water in the recess is the same, measured from outlet to center of overflow. Dimensions of the tub are 49½ inches from front to back, 48 inches wide and sixteen inches high.

#### E7

##### ENDURO 18-8 TYPES

A 16-page brochure, released by Republic Steel Corporation, Central Alloy Division, Massillon, Ohio, contains up-to-the-minute data on Enduro 18-8 Stainless Steel as well as several of the more important variations which make up the Enduro 18-8 series of types. These include Enduro 18-8-S, 18-8-STi, 18-8-SMO and 18-8-FM. Metallurgical and fabrication data are given. A feature of the booklet, designated as Bulletin 125, is a table of laboratory corrosion data listing the degree of corrosion-resistance of Enduro 18-8 Stainless Steel, Enduro AA and Enduro S to each of more than three hundred chemical reagents, solutions and products under varying conditions of temperature and concentration.

#### E8

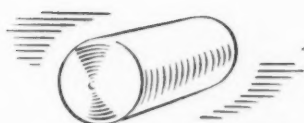
##### UNITED STATES RADIATOR PRODUCTS

Five brochures and booklets are released by the United States Radiator Corporation describing heating equipment manufactured under its own name and under that of its subsidiary, Pacific Steel Boiler Corporation. Brief descriptions follow: (1) Capitol Fincast Radiator, a single unit of cast iron, used with vapor, vacuum and hot water heating systems. In tabular and illustrative form all information about the steam and water ratings, about the dimensions, construction and appearance of the fincast radiator are given in the printed release; (2) Capitol Oil Burning Boiler. Of cast iron construction it is designed for completely automatic operation and is intended for large and small homes; (3) Pacific Red Crest welded steel boilers for bungalows, residences, small apartments. Coal, coke, oil or gas can be used for fuel; (4) Pacific Steel Heating Boilers meeting the need for low water line construction. These also are of welded construction; (5) Capitol Red Top Boilers for every fuel and for every type of building. Built in three sizes to meet the requirements of various size buildings.

#### E9

##### STURTEVANT CENTRAL CLEANING

A new catalogue on Sturtevant central vacuum cleaning systems is being released. In addition to diagrammatic description and illustration of the equipment, this catalogue contains many pages of interesting information on the economic values of a central cleaning system. Another point of interest is the showing of buildings of various types and sizes for which data is given relative to the sweeper capacity of the machine in use.

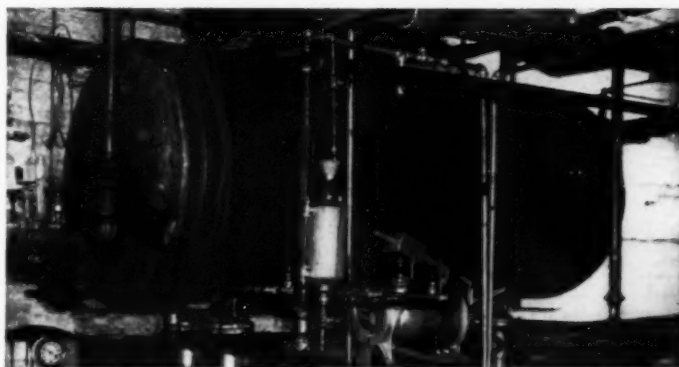


*The Life-Story of one Rustable Heater in Cincinnati*  
 NEW in 1926...rust...more rust...costly leaks...CONDEMNED in 1933

## ...then Ziegler selected a storage heater of *rustless* EVERDUR

IN 1926 Ziegler Towel Supply Company installed a brand new storage heater of rustable metal. It gave satisfactory service for a time, as any good heater will—regardless of the kind of metal used. But the usual thing happened. By 1933 the tank had pitted so badly that frequent repair-welding stopped the leaks only temporarily. Then the heater was condemned by the insurance inspector who refused to issue a new policy on it!

Faced with the necessity of buying a new heater, this laundry owner considered the merits of several available types, and then visited a neighboring laundry which had recently remedied a situation not unlike his own. There the new rustless equipment was praised so highly that the Ziegler



All-Welded Whitlock Everdur Type-K storage heater, in the plant of Ziegler Towel Supply Co., Cincinnati. Hooked up with Anaconda Brass Pipe or Copper Tubes, it will provide a plentiful supply of rust-free hot water indefinitely.

company contracted for a heater of the same identical metal...durable, strong, *rustless* Everdur!

Nearly all copper, the accepted non-rust metal... Everdur is scientifically alloyed to provide the strength and welding properties of steel.

And Everdur *cannot* rust! Thus this Anaconda Metal possesses all the requirements for durable, rustless tanks. And leading equipment manufacturers are prepared to quote on and furnish Everdur tanks and heaters of all types for apartments, hotels, hospitals, office buildings, laundries, etc. Everdur is also widely used for masonry anchors, ducts, smoke washers, and Electrical

Metallic Tubing. ¶ Additional information and names of concerns experienced in fabricating tanks of this rustless metal, furnished on request.

### EVERDUR METAL

"Everdur" is a registered trade-mark identifying products of The American Brass Co. made from alloys of copper, silicon and other elements.



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# EVERDUR METAL *for* TANKS

**E10****NEW G-E ELECTRODE**

A general-purpose welding electrode, designated as the Type W-22, has been added to the General Electric line of arc welding electrodes. The new electrode is of the heavily coated or shielded-arc type and produces welds of the quality required for Class I pressure vessels according to the A.S.M.E. Boiler Construction Code. Its distinctive feature is that it may be used in any position, i.e., for flat, vertical, or overhead welding, and at the same time has deep penetrating properties. It is therefore equally suitable for butt and fillet welds.

**E11****NEW TYPE OF WINDOW**

A new steel window embodying features of sound control and efficient ventilation has been announced by Truscon Steel Company of Youngstown, Ohio. The Silentaire Window is an improvement over the Truscon Silentaire which is a non-mechanical muffler that excludes street noises yet provides ample natural ventilation, free from drafts. The new windows embody all the advantages of the Silentaire plus the modern design and construction of Truscon Steel Windows.

A complete shop-fabricated unit, the first cost of Silentaire Windows, according to the manufacturer, is but little more than that for a standard window. Erection is simple. There are no maintenance or operation costs. The new window is said to provide a quietness similar to that obtained with an ordinary window, tightly closed. It permits sufficient volume of air through the Silentaire unit without the use of blowers, fans or other mechanical means. The outside deflector and the inside reflector prevent rain or snow from entering the room and such rain or snow which may strike the ventilator is carried away through outlets in the sill section.

**E12****THE PHILADELPHIA AND READING COAL AND IRON COMPANY**

The world's first combined commercial heating and refrigerating plant using anthracite coal was recently placed in operation in Pottsville, Pa.

The plant is a development of the Pottsville Laboratories of The Philadelphia and Reading Coal and Iron Company, owners and operators of coal lands in the Reading Anthracite region. Last year the Company's laboratories announced the completion of an anthracite-burning furnace, which provides the energy for complete air conditioning and refrigerating in residences and performs many household tasks. According to the manufacturer, this furnace can be used to heat the home in winter, cool it in summer, wash and dry clothes in the laundry, provide a constant supply of hot water, operate the refrigerator, etc. The principles applied in the manufacture of the household furnace have been further developed in the production of the new commercial type installation which will be of particular service to the meat, dairy, fruits and provision industries and to restaurants and similar commercial establishments.

**E13****PENN TEMTROL**

The new Penn system of temperature control is described in a booklet released by the Penn Electric Switch Co. of Des Moines, Iowa. The system, known as Penn Temtrol, is based upon findings in an exhaustive study of room-temperature control. A higher degree of comfort is said to be achieved by minimizing variations. The manufacturer claims that the Penn Temtrol regulator possesses an exceptional sensitivity, maintaining, near its location, a uniformity of temperature within  $\frac{1}{4}$  degree. The system is adaptable to all types of heating.

## ACID DEVILS

The little demons that eat away pipe, cause leaks and breakdowns just where they make the most trouble . . . you can chase them away forever with DURIRON

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See Our Catalog in Sweet's

# DURIRON

## ACID PROOF

# DRAIN PIPE



# NEWMARBLE Asbestos-Cement Panels

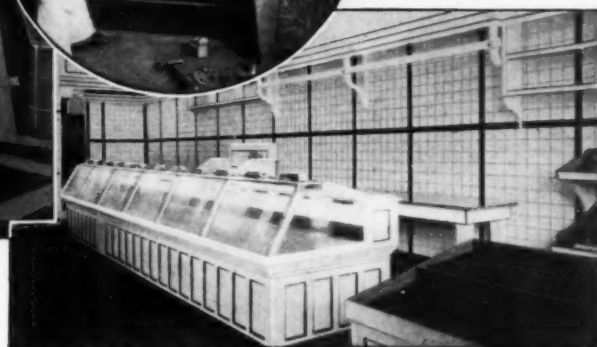
*Lower the COST  
of MODERNIZING  
Store Fronts . . . .*



Interesting store front finished with NEWMARBLE in Black and Gold.



NEWMARBLE  
Asbestos-Cement  
Panels often used  
with Newtile  
for Stores.



Interior of chain grocery and meat market where both NEWTILE and NEWMARBLE have been used effectively.

## Unique RUBER-OLD Product of Lustrous, Lasting Beauty Ideal for Interior Walls, too!

*W*HEN you desire the beauty of the rarest, colorful marbles at a surprisingly low cost use NEWMARBLE Asbestos-Cement panels.

This modern RUBER-OLD Building Product is ideal for store fronts and exteriors as well as for apartment house foyers, theatre lobbies, office hallways, hospitals, department stores, etc. NEWMARBLE faithfully simulates the beautiful designs of marble. Both colors and designs are an integral part

of each panel. It provides a lovely finish that is fire- and weather-resisting, durable, and easy to keep clean.

Panels are large in size, 32" x 48", but light in weight, about 2 lbs. to the square foot. They are easy to cut, fit and may be quickly installed at a remarkably low cost. NEWMARBLE Trim and Cap Moulding is available in blending or contrasting finishes in 4 and 6 in. widths. For further facts see Sweet's or phone any Ruberoid office.

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SEE 1934 SWEET'S ARCHITECTURAL CATALOGUES

### RUBER-OLD ARCHITECTURAL PRODUCTS

- BUILT-UP ROOFS
- ASBESTOS SHINGLES
- ASBESTOS SIDINGS
- NEWMARBLE
- NEWTILE
- ASPHALT SHINGLES
- WATERPROOF SHEATHINGS
- CEMENT WATERPROOFING

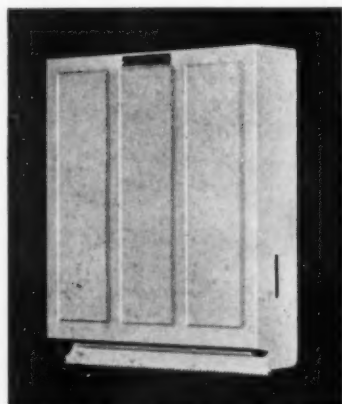




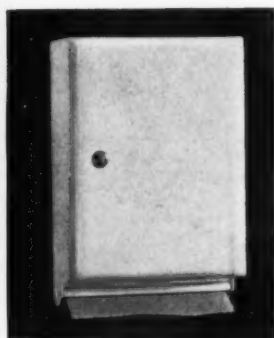
## SPECIFICATIONS:

### Onliwon Towel and Tissue Cabinets

OK



Onliwon White Enamel  
Toilet and Towel Cabinets



IT'S part of an architect's job to "think of everything"—and it's far from an easy one. Yet you can make it so much easier by standardizing on A.P.W. Onliwon Towel and Tissue Cabinets for *all* your washroom specifications. Onliwon is a name your clients know and respect. They have become familiar with it through the every-day use of washrooms in office and public buildings, hotels, schools and colleges from coast to coast.

A.P.W. Onliwon Towel and Tissue Cabinets are neat in appearance. They are simple, foolproof and do their job efficiently—dispensing high quality towels and tissue in a way that prevents waste, unnecessary litter, and gives genuine health protection to every user. Onliwon Cabinets are always available in correct sizes, the right materials. Send today for a catalogue giving full details of all types—surface and recess, metal and solid porcelain. A.P.W. Paper Co., Albany, N. Y.

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#### E14 MARBLETONE



A finish that can be applied to panels, wainscoting, ceilings and walls, counters and bars, sinks and a variety of other surfaces, is announced by Marbltone Co. of Brooklyn, N. Y. The product is called Marbltone, having the appearance of marble, and said to be durable, the finish gaining in hardness with time.

The application of Marbltone to glass, wall board, wood or other material is made at the factory. Installation and handling of the material are the same after finish has been applied. Samples of Marbltone are offered by the manufacturer.

#### E15

##### OTIS UNDERCOUNTER DUMBWAITER

Intended mainly for stores but also applicable to hotels, restaurants, hospitals and homes, the Otis undercounter dumbwaiter embodies automatic electric control, welded steel car, steel hoisting frame and heavy steel elevator guides. It is designed as a complete unit. It has a capacity of 300 pounds with a speed of 50 feet per minute. Maximum rise is 17' 6". Controlled by automatic push button.

#### E16

##### PROCEDURE HANDBOOK OF ARC WELDING DESIGN AND PRACTICE

A 434-page book, "Procedure Handbook of Arc Welding Design and Practice," is announced by the Lincoln Electric Company. It is said to be the most complete handbook ever published on the subject of the art of arc welding, its applications, and design procedure for the most efficient use of the process. The book is a compendium of pertinent information and accurate data prepared for the use not only of users or prospective users of the electric arc process of welding but also for those responsible for the design of products and structures which may be built by welding.

The book is divided into eight parts including among them chapters on (1) Welding Methods and Equipment; (2) Welding Procedure, Speeds and Costs; (3) Weldability of Metals; (4) Design for Arc-Welded Fabrication of Steel Structures. The volume is amply illustrated with detailed drawings and photographs.

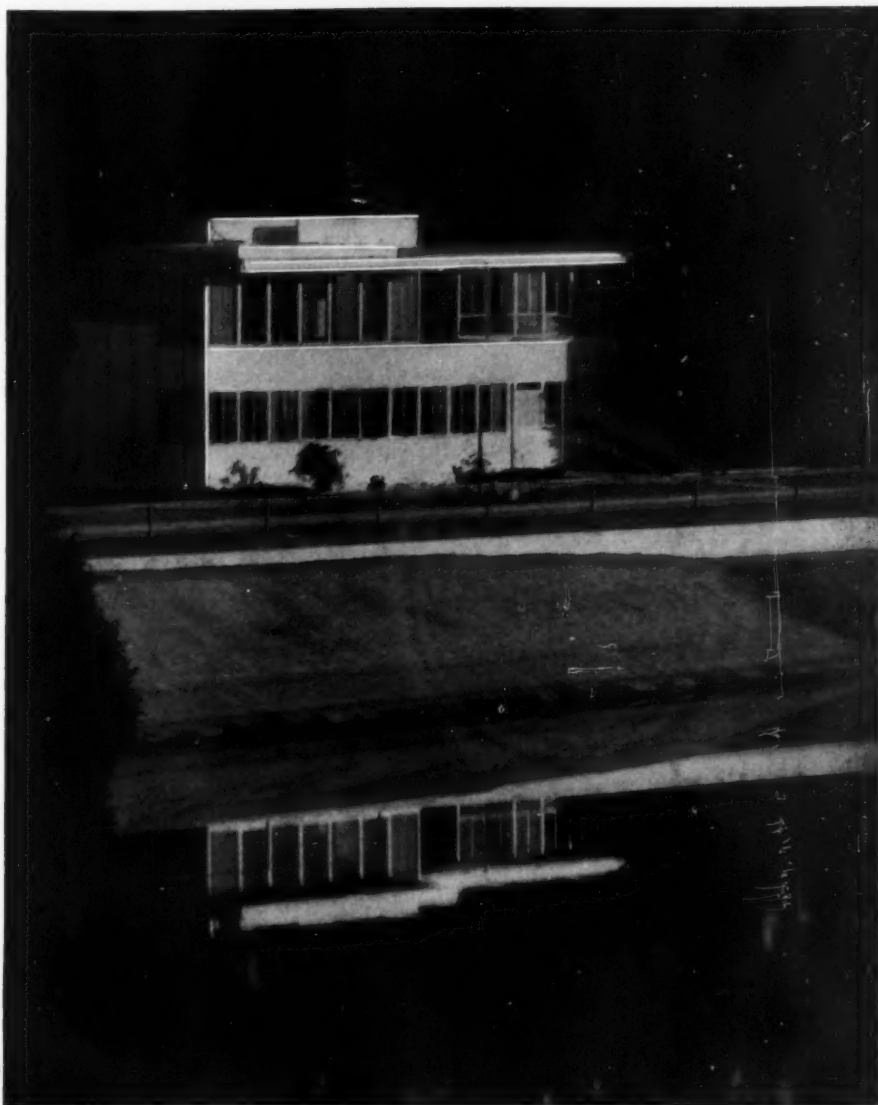
#### E17

##### THREE INTENSITIES OF LIGHT FROM ONE LAMP

Three intensities of light may now be secured from one lamp in an indirect lighting fixture offered by Curtis Lighting, Inc., of Chicago. This lamp is standard and is available in a regular 300 or 500-watt size. Each lamp has two filaments which may

*This is one of a series of pages devoted to the modern treatment of certain interesting details in construction.*

•  
*The Van Der Leeuw Research House, overlooking Silver Lake in Los Angeles, California. Architect: Richard J. Neutra. The products of Libbey-Owens-Ford used exclusively in glazing.*



GLASS

## *dominates design*

A peek at the boards of many leading architects discloses a new and refreshing trend in residential plans. Windows . . . more windows, bigger windows, picture windows, corner windows . . . are the keynote of construction. The same increased use of glass is apparent in the interior, as well. More space is specially planned for mirrors; glass is specified for closet doors and shelves; provision is made

for glass screens and panels, both clear and obscure, in kitchens, baths and dining alcoves. In reality, a new type home has been created . . . a home dominated by glass . . . clear, fine, flat glass . . . the product of Libbey-Owens-Ford.

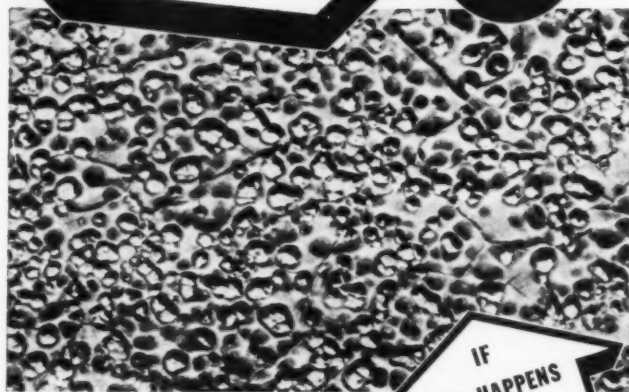
**LIBBEY-OWENS-FORD GLASS CO.,**  
TOLEDO, OHIO, *manufacturers of Highest Quality Flat Drawn Window Glass, Polished Plate Glass and Safety Glass; also distributors of Figured and Wire Glass, manufactured by the Blue Ridge Glass Corp. of Kingsport, Tenn.*

**LIBBEY-OWENS-FORD**  
**QUALITY GLASS**



# ROOFING FAILURES

NO.4



A close-up of smooth-top roof that has become "cheesy".

IF  
THIS HAPPENS  
TO YOUR ROOFS  
IT HURTS YOUR  
REPUTATION

**PROLONGED** contact with water causes the disintegration shown in this close-up photograph of a flat smooth-top roof. Water may be in contact with the roofing for days. Snow may remain on a roof for weeks. This prolonged contact with water or snow causes some roofings to become "cheesy".

When this occurs, water seeps into the roof deck and into the building. When there is insulation, it keeps the roof deck wet even longer.

Koppers Coal Tar Pitch is **NOT** affected by water. Roofs built of Koppers Old Style Pitch and Approved Tarred Felt do **NOT** become "cheesy". That is one reason why they last years longer than other roofs.

**FOR ROOFING OR RE-ROOFING, specify**

1.

**KOPPERS COAL TAR PITCH**

2.

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3.

**AND A GRAVEL OR SLAG SURFACE**

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be lighted alone or together. In the 300-watt lamp, as an example, by turning on the switch that controls one of the filaments the intensity of a 150-watt lamp is secured. Turning on the other gives the intensity of a 200-watt lamp. Both filaments can be operated at the same time, giving a total output equivalent to 350 watts. Where only a single circuit wall switch is used a pull switch may be installed at the fixture to obtain two intensities of light. Two small pull switches installed in the fixture would then provide the three intensities. Curtis Lighting have a complete line of modern indirect lighting fixtures for use with the new three-light lamp.

## E18

### SPANDRELS

"Contemporary Spandrel Design" is a booklet announced by Aluminum Company of America. Picturing spandrels used in prominent buildings throughout the country, it is a good source of suggestion for spandrel design. Information and ideas pertaining to both technical and design considerations involved in the origination, casting, anchoring and installation and maintenance of spandrels complete the contents of this useful booklet.

## E19

### SILENT COMBINATION

"Si-flo Combination" describes an efficient combination of flush valve and closet bowl. Objectionable noises communicated over a wide area by supply lines running under floors and between walls are said to be largely overcome by the Speakman Company in this new combination design, each unit of which was shaped and constructed to minimize noise without sacrifice of efficiency in operation.

## E20

### IMPROVED WHITE PAINT

Several advances in the manufacture of white paint are claimed for Barreled Sunlight by the manufacturer, U. S. Gutta Percha Paint Company, Providence, R. I. A longer lasting white with exceptional light-reflecting power, also new economies due to a reduction in quantity of paint required for a given area are said to recommend Barreled Sunlight especially for use in new or remodeled industrial buildings.

## TRADE ANNOUNCEMENTS

### COPPUS APPOINTS CECIL

Coppus Engineering Corporation, Worcester, Mass., announces the appointment of Lawrence K. Cecil, 1531 East 35th St., Tulsa, Oklahoma, to handle sales in the Oklahoma and Texas territory. Mr. Cecil will handle the Annis Air Filters for air compressors and for industrial and ventilating applications.



# FROM PROSE...



**Architect Manoug Exerjian remodels New York apartment and obtains striking glaze finishes with Dutch Boy**

COUNTLESS thousands of commonplace interiors join the modernization parade. Here is one of them . . . a job by Manoug Exerjian, New York architect, who converts a prosaic apartment on 33rd Street into an office of remarkable interest and charm.

***Dutch Boy . . . the ideal glazing base***

Mr. Exerjian gives much of the credit for the pleasing result to the beautiful glaze effects on walls and woodwork, made possible by the use of Dutch Boy White-Lead.

"There is no more beautiful paint finish than glaz-

ing," says Mr. Exerjian, "but not more than 1 out of 10 jobs is done successfully.

"This is largely due to improper preparation of the base. The base paint must never be dead flat. It should have a slight sheen.

"By mixing Dutch Boy White-Lead in the proper proportions you obtain the ideal base for this kind of finish."

***Dutch Boy provides paint for every surface . . . and every finish***

Dutch Boy White-Lead makes paint for wood, plaster, wall board, metal, brick, stucco and other surfaces.



# ...TO POETRY



Moreover it makes paint for finishes of every kind. Mixed with linseed oil it produces long-wearing exterior paint. Mixed with flattening oil it provides durable, washable interior finishes . . . plain, mottled, glazed, blended or textured. And by adding Dutch Boy colors-in-oil you can obtain any one of a thousand tints.

So plan your modernization with Dutch Boy in mind, whether it be for an apartment hotel, home or any other kind of building. It offers not only utility, beauty and durability, but exceptional economy as well.



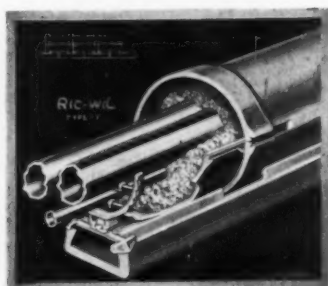
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UNSEED OIL - FLATTING OIL - LIQUID DRIER - WALL PRIMER - COLORS-IN-OIL



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722 Chestnut Street, St. Louis; 2240 24th Street,  
San Francisco; National-Boston Lead Co., 800  
Albany Street, Boston; National Lead & Oil Co.  
of Pa., 316 Fourth Avenue, Pittsburgh; John T.  
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**THE TRANE COMPANY**

R. H. Anderegg has recently been promoted to Vice-president in Charge of Engineering by The Trane Company, La Crosse, Wisconsin. Mr. Anderegg has been connected with the company for a number of years as Chief Engineer and later as Central Division Sales Manager.

**SOUTHERN CHEMICAL CORPORATION**

American Cyanamid Company and Pittsburgh Plate Glass Company jointly have formed the Southern Chemical Corporation, with a Delaware charter, and have qualified to do business in Texas. The new Corporation will produce a varied line of chemicals in connection with the operation of the alkali plant being constructed at Corpus Christi, Texas, by Southern Alkali Corporation, also jointly owned by the two above mentioned companies. The principal officers of Southern Chemical Corporation are: Chairman, W. B. Bell; President, H. L. Derby. It is expected that the plant at Corpus Christi, which has been under construction for something over a year, will be in operation this Fall.

**READING IRON COMPANY**

Effective April 3, Mr. A. F. King, formerly with the Buffalo and Philadelphia District Sales Offices of the Reading Iron Company, was transferred to Boston, Massachusetts, as District Sales Representative with headquarters in Boston. Mr. John G. Ross, for many years District Sales Representative in Boston, has resigned to accept a position elsewhere.

**CHASE BRASS & COPPER COMPANY**

On May 1 the Chase Brass & Copper Company entered new quarters at 10 East 40th Street, New York City. With its affiliated and subsidiary companies, including the American Brass and Copper Company, the Erskine Radiator Division and the Consolidated Safety Pin Company, five floors are occupied. Extensive alterations were made in these floors to house the company personnel and to provide for display of products.

**GENERAL ELECTRIC COMPANY**

The opening of two additional district offices to serve as local headquarters for surrounding territory has been announced by the General Electric Contracts Corporation. One of the new offices is located in Los Angeles, California. R. E. Boian is acting manager. The local office in Louisville, Kentucky, has been enlarged and made a district office. S. W. Dail, former local manager, has been made district manager.